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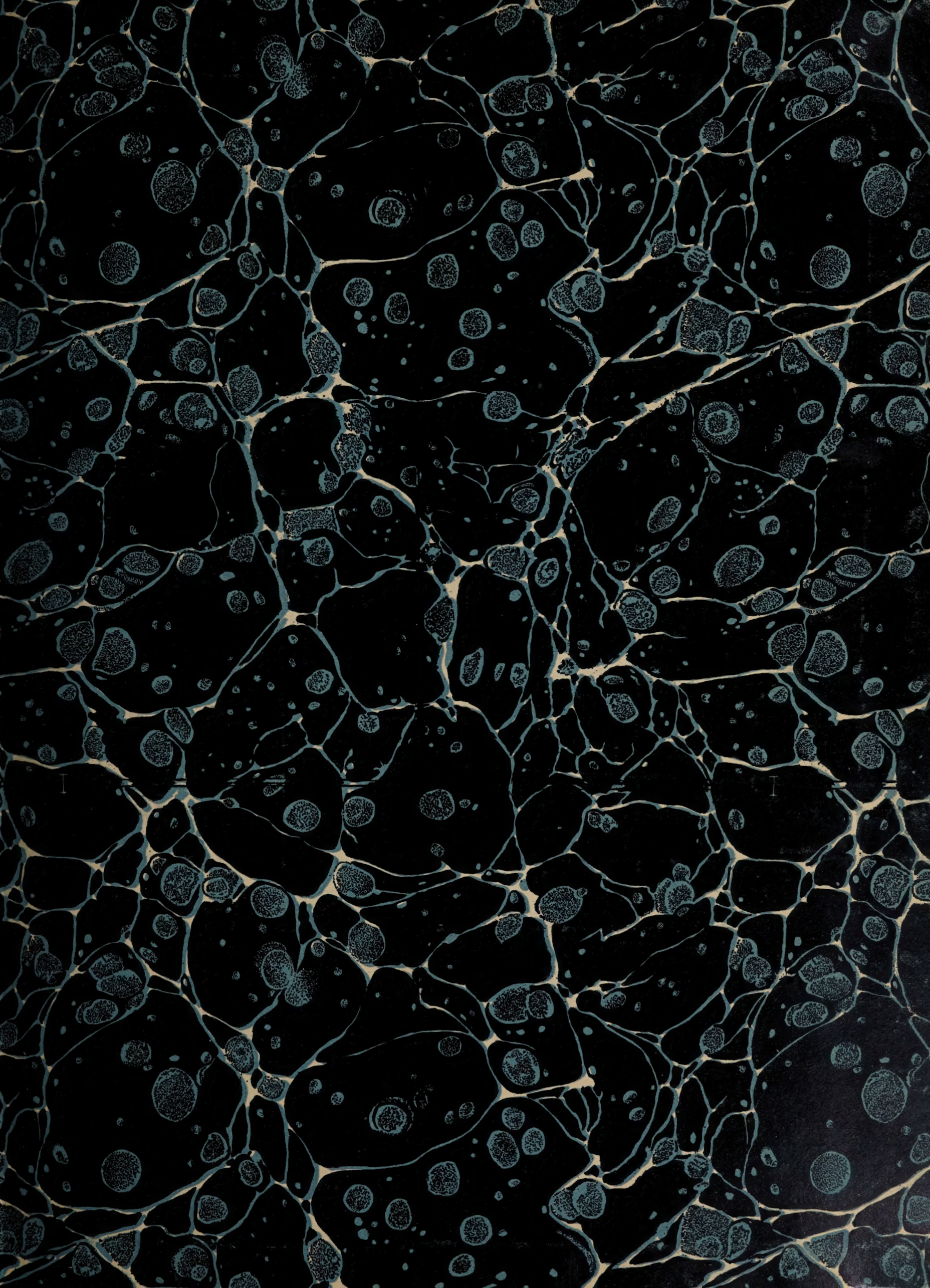
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HISTORY OF AGRICULTURAL EDUCATION IN THE UNITED STATES

1785 - 1925

by

Alfred Charles True,
Specialist in States Relations Work,
United States Department of Agriculture.

Parts 1-3

This is a first draft of the History of Agricultural Education in the United States, afterwards published in somewhat abbreviated form in U. S. D. A. Misc. Pub. No. 36, 1929.

September, 1928.

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History of Agricultural Education in the United States
1785 - 1925

By Alfred Charles True,
Specialist in States Relations Work,
United States Department of Agriculture.

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Preface

This general history of agricultural education in the United States has been prepared as the result of a request of the Executive Committee of the Association of Land-grant Colleges, which was approved by former Secretary of Agriculture, Henry C. Wallace. To understand the movement which has resulted in the broad development of agricultural education in this country it is necessary that its relation should be shown to the general development and progress of science and education and the background of economic conditions and of organizations of various kinds for the promotion of agriculture and country life. Considerable attention has therefore been given to these matters, particularly as related to the earlier stages of agricultural education. Such a brief outline of collateral material as is included in this work may appear trite and superficial to the experts in these subjects but it is hoped that it will be useful to students in colleges and schools and to the general readers who may consult this book. It has not yet been practicable to give accounts of the development of agricultural education in all the several States and Territories. It has rather been the effort to use details regarding individuals, organizations and institutions to bring out the various phases of the movement.

Our agricultural colleges have often been unfairly criticized because there has not been a good understanding of the actual organization of agricultural instruction as only a part of the much broader work of the institutions with which it is connected. Failure to recognize the widespread influence which these institutions have had on agricultural progress through their experiment stations and extension work, as well as the promotion of agricultural instruction in secondary and elementary schools, has also led many people to minimize their educational importance. The breadth of the American system of agricultural education has therefore been emphasized in this book.

To give ample space to the history of agricultural research and extension work would, however, have expanded this volume beyond reasonable limits. It is therefore proposed to prepare separate monographs on these very important features of agricultural education.

The materials for this history have been drawn from a great variety of sources and often these have been freely used in the make-up of this book. In many cases it has not been feasible to indicate the source of particular statements but care has been taken to make the bibliography of works used fairly complete. Special acknowledgement is made of the assistance of Mr. F. A. Merrill, Specialist in Agricultural Education, and Miss J. L. Weston of the Department of Agriculture in the preparation of this volume, and of Miss Barnett and Miss Hawks of the Department Library in the collection of material for this work. Miss Feldkamp of the library of the Office of Experiment Stations put the bibliography in proper form. Prof. D. J. Crosby, late on the faculty of the New York College of Agriculture at Cornell University, but also associated for many years with the author in the educational work of the Office of Experiment Stations and States Relations Service carefully read the manuscript and made many helpful suggestions for its improvement.

PART I

THE FOUNDATIONS OF THE AMERICAN SYSTEM OF AGRICULTURAL EDUCATION

INTRODUCTION

With the close of the Revolutionary War and the assured independence of the United States of America the leaders of enterprise and public opinion in this country began more definitely to make plans for the promotion of the agricultural, industrial, commercial, political and social interests of the new nation. This was chiefly a country of agricultural and rural communities. Farming included not only the production and sale of crops and live stock, but also cutting of wood for fuel and lumber, the weaving and making of clothes, tanning of leather and the manufacture of household furniture and farm implements. Such artisans as were needed to construct and repair buildings and vehicles, shoe horses, grind grain, etc. were often partly engaged in farming. This was also true of the storekeepers who distributed the few articles brought in from the cities and the men who had small mills and factories, many of which depended on the water-power from the small streams adjacent to the farms. Even the commercial and professional people of the comparatively few cities of that period invested their surplus funds largely in land speculation and agricultural enterprises.

Many of the soldiers of the Revolution, when relieved of their military duties, together with other adventurous spirits, took advantage of the grants of land or even without this incentive pushed out into the unoccupied regions of the original colonies and even beyond the Alleghanies to clear the land and make homes on virgin soils. Thus was begun a vast expansion of American agriculture and the building up of rural communities largely unhampered by traditions and willing to undertake experiments in agriculture, education and social organization. Meanwhile the older settlements along the Atlantic Coast had followed a crude and exhausting practice of agriculture and were seeking means of increasing the fertility of their lands. The movement of population called strongly for improved methods of communication and there was great activity in building roads, bridges and canals, as well as ships and boats for inland and coastwise navigation. The dispersion of the farm laborers and the increasing size of farm operations made the necessity for improved farm implements more and more apparent.

Under such circumstances it was natural for political and social leaders to take a deep interest in the promotion of agriculture and to connect this closely with the promotion of commerce, manufactures and the arts.

To understand the movement in the United States which has resulted in our nation-wide system of agricultural research and education it is necessary to know how its beginnings were related to the history and progress of science and education in both Europe and America.

While the States had withdrawn from their colonial and political relations with Great Britain, their people renewed in large measure after the war the varied intercourse with individuals and institutions in the mother country and were very largely influenced by the movements in thought and action there with reference to agricultural, industrial and social affairs. They also took greater interest in similar movements on the Continent of Europe, particularly in France whose timely and effective assistance had done so much to make their political independence possible, and to a less extent in Germany and Switzerland. These private foreign relations were stimulated and enlarged by increased correspondence, interchange of publications, travel, and residence abroad for education, business, health or pleasure. The public embassies and consular offices established after the Revolution, as well as the visits of naval officers on official business, resulted in increase of information regarding European affairs and this was disseminated widely in this country through the press and otherwise.

All this happened at a time when there were already in Western Europe a considerable literature on agriculture and quite a number of organizations and institutions devoted to the promotion of agriculture. The natural sciences were also taking more definite shape, their relations to agriculture were becoming more apparent and there was a growing hope that their future developments would greatly promote agricultural advancement.

The peoples and their governments were beginning to realize that the diversification and strengthening of agriculture to meet the needs of increasing populations and a more complex civilization were very important objects to be promoted. There was therefore a search for new crops, better live stock and improved farm implements and cultural methods.

The 18th Century in Europe had been marked by the establishment of a number of agricultural societies and schools, in connection with which agriculture was taught and practiced. Books and pamphlets on agricultural subjects were quite numerous. Knowledge of these things was available in America and greatly influenced the origin and progress of the movement for agricultural advancement in this country. To understand this movement we must have in mind the similar movement in the old world. We shall therefore briefly consider the European situation as regards agricultural societies, schools and publications, during the latter part of the 18th century and the first quarter of the 19th century, as well as the early general movement in education and science as it affected agriculture.

DEVELOPMENT OF EDUCATION IN EUROPE

From the time of the Renaissance, which carried with it an ever increasing study of the ancient literature of Greece and Rome, there was a tendency to relate education to the actual needs of human life and to give attention to nature and its relations to practical affairs. For the most part this was done by seeking in the classical literature the knowledge desired and therefore making the school and university curricula to consist very largely of the study of Greek and Latin.

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According to Professor Paul Monroe -

"The fullest expression of the opportunities, duties, and interests of life was to be found in the classics. * * * * * The great educational contribution of the Renaissance was the recovery or reformulation of the conception of the liberal education, which included the physical, the aesthetic, the moral, the literary and social, as well as the abstract literary, theological, and ecclesiastical elements. This education aimed at the development of the free man possessing individuality of his own, and power of efficient participation in everyday life, based upon a wide knowledge of life in the past and an appreciation of opportunities of life in the present. At its best it demanded that such a man should possess, as the evidence of his education, the moral purpose to make his knowledge and power of service in the needs of his country and the life of his fellow-men. It must be admitted, however, that this last feature was due rather to the fact that most of these educational treatises were written as a guide for the bringing up of children of the nobility, who were prospective rulers of petty principalities, and hence that this emphasis upon the practical and moral element was not so much a social one as one from the point of view of their own individual activities and opportunities." (79)

The maintenance of education was considered to be the function of the church and this idea was generally accepted by the Protestants at the time of the Reformation. Luther, however, favored the support of education by the State and also urged that schooling "be brought to all the people, noble and common, rich and poor; it was to include both boys and girls - a remarkable advance; finally, the State was to use compulsion if necessary." He would also have children spend only a limited part of the day in school, and have them engage in learning a trade or other occupation at home for the rest of the time. Here was a fore-shadowing of a system of vocational education.

"In 1524 the city of Magdeburg established its schools on the plan advised by Luther" and in 1565 Wurtemberg adopted a plan which included Latin schools and the university, but also "elementary vernacular schools in every village, in which reading, writing, religion and sacred music were taught." (79)

In 1619 Weimar adopted the principle of compulsory education for children of all classes, providing "that all children, girls as well as boys, should be kept in school from the sixth to the twelfth year."

Teaching orders also arose in the Roman Catholic Church and had a wide control of education in many parts of Europe. The Jesuits, especially, did much to improve the system of education in the secondary and higher institutions under their control and gave much attention to the preparation of teachers. At the opening of the 18th century they had 612 colleges, 157 normal schools, 24 universities, and 200 missions.

In their mission work they often gave practical training in agriculture and mechanic arts, and this was done in their relations with the Indians and some colonists in America. An interesting example of this kind of work is given by Parkman in connection with his account of Francois de Laval, the first bishop of Quebec. After Laval founded in 1647 a seminary for training priests at Quebec he added a Lesser Seminary for boys in 1668 and connected with it a kind of farm school. This was located in the Parish of St. Joachi, below Quebec. At this school "the children of artisans and peasants were taught farming and various mechanical arts and thoroughly grounded in the doctrines and discipline of the church." (65)

Gradually men with more originality and venturesome spirit began to go outside the ancient literature to study nature itself, and as a result we have the beginnings of modern science in the 16th and 17th centuries. A desire to use this new knowledge in education also began to appear. Among those who influenced the movement in this direction was Rabelais (1483-1553), a university man and a physician. His training in medicine led him to have an interest in the natural sciences then beginning their development and he would have the pupil study nature as well as books and use his knowledge in the practical affairs of life.

While Francis Bacon (1561-1626) "possessed little knowledge or interest in either educational questions or processes, and wrote nothing directly on either question; yet he it was who gave learning or science, and consequently education, a new basis, a new purpose and a new tendency." As the "method elaborated by Bacon revolutionized the scientific knowledge of the race and led to unprecedented progress, so its educational application, as made by his followers, especially as introduced by Comenius, in time revolutionized school methods." (79)

John Amos Comenius (1592-1670) held that "the ultimate religious end [of education] was to be obtained through moral control over one's self, and this in turn was to be secured by knowledge of one's self and consequently of all things. Knowledge, virtue and piety, in this order of their acquisition, were the aims of education." His greatest aspiration was "the complete reorganization of human knowledge along Baconian lines, with the consequent expansion of this knowledge and of human power and happiness. Among the principles on which his teaching and text-books were based are (1) Whatever is to be known must be taught (that is, by presenting the object or the idea directly to the child, not merely through its form or symbol); (2) Whatever is taught should be taught as being of practical application in every day life and of some definite use." (79) "The most remarkable and most successful" of his texts was *Orbis Pictus* -- The World of Sensible Things Pictured, the first illustrated book for children.

The earlier writings of Comenius were introduced in England by Samuel Hartlib (c1600-c1670), his friend and champion, in 1637-39, and Comenius himself went to England in 1641 at the invitation of Parliament, presumably with the intention of establishing a school there. (108)

Hartlib is said to have been the son of a Protestant Polish merchant who had fled to Prussia to escape persecution. He went to London about 1628, engaged in literary and educational activities, and wrote much on education, agriculture and religion, having to his credit not less than 22 books. He is chiefly interesting in this connection because of intimate relations with Comenius and with John Milton, who addressed to him the famous "Tractate of Education", published in 1644.

About the same time Hartlib was engaged in preparing a little book, published in 1651, entitled "An Essay for Advancement of Husbandry-Learning; or Proposition for the Erecting Colledge of Husbandry; and, in order thereunto, for the taking in of Pupills or Apprentices. And also Friends or Fellowes of the Same Colledge or Society." This contains a detailed statement of the subject to be taught and the means to be used in securing financial support for the institution. Apparently this scheme of Hartlib's had been the subject of more or less discussion in certain circles prior to the publication of his book and attracted the attention of Milton and others interested in the educational problems of the day.

In the Tractate of Education, published in 1644 and addressed to Hartlib, Milton followed very largely the plan of education suggested by Rabelais, which involved a very broad study of classical literature including agriculture as described by Cato, Columella and Varro. Here is found also the definition of "a complete and generous education" as "that which fits a man to perform justly, skillfully and magnanimously all the offices both private and public of Peace and War."

Beginning in 1692, Francke carried out the ideas of Comenius by establishing at Halle a group of educational and charitable institutions in which there was "a combination of Christianity and practical training, with formal school work", and in 1747 Hecker, a pupil of Francke, founded the first of the Real schools of Germany.

"In England the introduction of the 'real studies' was bound up with the history of 'Academies'. * * * The beginning of this movement is connected with the humanistic realism of Milton, who styled the institution described in his Tractate an academy." (79) The academies founded were privately supported but often included in their curriculum studies having a practical bearing, along with English, ancient and modern languages and mathematics. These institutions existed along with the old type of classical public schools. Both types of secondary schools were transferred from England to America. In this country the first "academy" was the "Academy and Charitable School of Pennsylvania", suggested by Benjamin Franklin in 1743 and opened in 1751.

"The universities responded much less quickly than the secondary institutions to the new educational ideas." In Germany, the University of Halle, founded in 1694, led the way in the introduction of new methods and subjects, including the natural sciences, and much progress was made by the close of the 18th century. The universities in Great Britain made much slower and incomplete progress.

John Locke (1632-1704) was an exponent of the mental and moral discipline of the individual as the chief aim of education but there should be "a sound mind in a sound body". He thought that intellectual discipline should be broad, as is shown by the following statement in his "Conduct of the Understanding";

"The business of education is not to make the young perfect in any one of the sciences, but so to open and dispose their minds as may best make them capable of any, when they shall apply themselves to it. * * * It is therefore to give them this freedom that I think they should be made to look into all sorts of knowledge and exercise their understanding in so wide a variety or stock of knowledge. But I do not propose it as a variety and stock of knowledge but a variety and freedom of thinking; as an increase of the powers and activities of the mind, not as an enlargement of its possessions." (79)

Jean Jacques Rousseau (1712-1770) in his "Emile" held that education is a natural process, involving an expansion of the natural powers, not an acquisition of information. He taught "that the educational material should be the facts and phenomena of nature, that it should consist chiefly in an inquiring into nature's laws and should be through an intimate, fearless and constant association with nature rather than man." He dwelt much on the importance of manual and industrial activities in education.

Heinrich Pestalozzi (1746-1826) was early influenced by the "Emile" and entered on an agricultural life, partly to improve some waste land through new methods of cultivation and partly to live according to naturalistic ideas. Experiments in bringing up his child according to the ideas of the "Emile" led him to see deficiencies in Rousseau's plan of education and started him on the formulation of a more positive and practical scheme. "From 1775-1780 Pestalozzi conducted what was probably the first 'industrial school for the poor'. The children were engaged in raising special farm products, in spinning and weaving of cotton and in other occupations. While so engaged they also spent some time in reading and committing passages to memory and especially in arithmetical exercises." Then followed a period of political activity and theorizing about education after which he became a teacher in elementary schools where he "worked out the significance of the object lesson" and attempted to show that "education is the natural, progressive, harmonious development of all the powers and faculties of the human being."

The first accounts of Pestalozzi's work published in the United States were
(p. 21)
written by William Maclure[^] of Philadelphia, who had been sent to Paris by President Jefferson as a member of the commission dealing with American claims arising from spoliation during the French Revolution. Having visited Pestalozzi and Fellenberg,
(p. 894)
he induced Joseph Neef[^], who had been associated with Pestalozzi, to come to this country in 1806, where he established a school at Philadelphia, afterwards removed to Village Green, Delaware County, Penn. Admiral Farragut was a pupil in the latter school.

When Maclure became interested in the social colony at New Harmony, Indiana, in 1825, he brought in Neef as a schoolmaster and provided museums, shops, experimental plots and other facilities. Such subjects as nature study and geography were taught by field lessons. This school ended with the breaking up of the colony in 1828.

Manual Labor Schools

Philipp Emanuel von Fellenberg (1771-1844) conducted very successfully from 1806 to 1844 at Hofwyl, near Yverdon, Switzerland, "a school that was pronounced by so competent an authority as Dr. Barnard to have been the most influential school that ever existed." The pedagogical principles underlying the work of the school were similar to those of Pestalozzi, with whom Fellenberg had been previously associated in a school experiment. The sociological purpose of the Hofwyl school was twofold; first, to educate the youth of the peasant class in agricultural and technical pursuits, and in connection with these industries to give them the elements of an intellectual education; second, to bring the upper class into closer sympathy and understanding with the peasant class by educating them together. Therefore, two schools were established on an estate of some six hundred acres; the literary institute, which gave the ordinary classical education, and the practical institute, which gave the education of the peasant boys for more intelligent farm work. Both groups of boys had school gardens, both were expected to work on the farm, one for training in future management, the other for future service. There was an agricultural school for scientific instruction, a printing press where the literature and music of the school were printed by the boys of the school, workshops where they made their clothing and agricultural and scientific instruments, and other similar institutions. In time there were established a school for girls and a normal school for teachers, where for a time all of the teachers of the adjacent city of Berne were trained. In almost every respect the schools seemed to be a parallel of those at Hampton, Va. Ala. Tuskegee, and other places that are attempting a similar solution of social and industrial problems.

From 1825 to 1840 scores of these "manual labor institutes" were established all over the United States. All, or very nearly all, the institutions of academic or collegiate rank that were established within these time limits, were founded upon this basis. Many of these, such as Oberlin, soon developed into colleges. The majority of them were fostered by some religious denomination. While in these institutions philanthropic and religious motives were prominent, the pedagogical principles of Fellenberg were minimized. In the American literature that grew out of this movement but two motives were emphasized: one, the opportunity afforded by these institutions for a higher education at a lessened expense; second, the better health and consequently more active intellectual life produced by the course of life followed. With the improvement of the economic conditions of the country and the development of more of the formalities of social life, toward the middle of the century, the manual labor feature was dropped from most of these institutions. (See also p. 169)

The Monitorial System of Bell and Lancaster

In 1797 Dr. Andrew Bell introduced into England a system which he had employed in an orphan asylum, that of using the older boys for the instruction of the younger. By him, and especially by Joseph Lancaster (1778-1838), the system was developed until it became for England a somewhat inadequate substitute for a national system of schools. Through the use of a few conduct monitors and a sufficient number of teaching monitors, drawn from the more advanced students, and through a system of organization and of method, it was possible for one teacher to direct a large number of pupils.

The great service which the Lancasterian system rendered in our own country was in accustoming the people to schools for the masses of the people, to contributing to their support as individuals, and in gradually educating the people to look upon education as a function of the state.

In 1805 the Lancasterian method was introduced into New York City. Within a few years almost every city from Boston to Charleston, in the South, and Cincinnati, in the West, had its monitorial or Lancasterian schools. Lancaster himself came to this country and assisted in the New York, Brooklyn, and Philadelphia schools. In the third decade of the century, the system was introduced in New York and Boston into a new type of schools, the newly founded high schools. For this and the two following decades the system was widely popular in the many academies throughout the country. As in the case of the Fellenberg system, with which it was often combined, the system disappeared in consequence of the arousing of public opinion on the subject of education, with the growing material prosperity of the people and their willingness to contribute more liberally to the cause of education.

Early Agricultural Schools

Ferdinand Kindermann (1740-1801), a Bohemian, sometimes called "Father of Industrial Education", under the patronage of Maria Theresa, founded an elementary school in which agriculture, music and religion were taught along with the three R's. This plan was also followed in other schools. In Bohemia an agricultural school was opened at Tirnova in 1791.

In Hungary agricultural schools were established at Zarvas in 1779; at Nagy-Micklós in 1786; the Georgicon Academy at Kezthely, founded in 1797, was for fifty years "the model agricultural college of Europe". (5)

Near the end of the 18th Century Frederick the Great undertook the development of agricultural schools as a part of a broad plan for improving the agricultural condition of Prussia, and his example was followed by his successors.

Albrecht Thaer (1752-1828) successfully engaged in practical and scientific farming and when visitors to his farm at Celle, in Hanover, became numerous he began in 1802, to give them instruction and this led to the establishment of the Agricultural Institute in that town. "In 1806 he founded the agricultural school at Moeglin, near Berlin, which became famous, and which was raised to the Royal Academy of Agriculture, 1824." Through his school and his writings Thaer has had a broad influence on the progress of agriculture and agricultural education.

In 1811 the Academy at Tharandt, in Saxony, was founded and a little later the agricultural college of the University of Leipsic. In Wurtemberg, the agricultural college of Hohenheim was founded in 1818, which had a large model farm. This institution was very successful and attracted much attention in other countries.

In France agriculture was recognized as a science for the first time by the Academy of Sciences in 1753, and in 1761 the National Society of Agriculture of France urged the appointment of agricultural professors. In 1762 de Goyan proposed the creation of agricultural schools in order to keep the children of farmers on the farms.

Bertin, Controller General of Finance under Louis XV, organized a special bureau of agriculture, established veterinary schools at Lyons in 1761 and Alfort in 1765, and with the aid of members of agricultural societies, then recently formed, and especially the one at Paris, attempted to create practical schools of agriculture at La Rochette near Melun in 1763 and near Compiègne in 1771, but was prevented by the financial embarrassment of the Government. Some years later a plan for an agricultural institute, devised by the Abbe Rozier, was presented to Louis XV, and again in 1800 to Bonaparte but was not put into active operation.

About 1820 Matthieu De Dombasle founded at Roville, near Nancy, the first school of agriculture worthy of that name in France, and almost entirely with private means maintained it for some time. In 1829 the school at Grignon and the following year the school at Grand-Jouan were founded by pupils of Dombasle and later became state schools.

DEVELOPMENT OF NATURAL SCIENCES RELATED TO AGRICULTURE

The movement for agricultural schools and colleges in the United States is so intimately associated with the greater educational movement for the introduction of the natural sciences into the curricula of educational institutions that it is desirable to consider at least the general condition of these sciences in the early days of the agricultural education agitation in this country. These sciences were then taking on more definite form and scientists, as well as practical men, were often considering their relation to agriculture and other industries. A brief account is therefore given here of some scientists and their publications who influenced to a greater or less extent the thought and action of our leaders in the agricultural education movement.

Chemistry

The foundation of modern chemistry was laid by Antoine Laurent Lavoisier(1743-94). He was born in Paris and educated at the Collège Mazarin. He gave great attention to the mathematical and physical sciences, studied botany under Jussieu and chemistry under Rouelle and had close relations with Guettard the geologist.

In 1768 he became a member of the Academy of Sciences. By quantitative experiments he proved the law of the conservation of mass and through the use of the quantitative method threw light on the nature of various substances and led to a clearer definition of the idea of chemical elements. He also advanced the binary theory of the formation of chemical compounds, which though inadequate gave rise to important results. In association with others, he also devised a rational system of chemical nomenclature. In 1789 he began experiments in a scientific way on one of his farms, which later led to the work of Boussingault.

Advantage of Lavoisier's work was taken by Sir Humphrey Davy (1778-1829), who became professor of chemistry at the Royal Institution of London and in 1803 began researches connected with agriculture. He lectured on agricultural chemistry before the British Board of Agriculture over a period of ten years. The lectures were published in 1813 under the title of "Elements of Agricultural Chemistry". Davy's work was well known in America and his book was much used by persons interested in agricultural progress and education.

Fredrick Accum (1769-1838), who for several years from 1801 collaborated with Davy, established in London a school of chemistry which, as stated by Dr. C. A. Browne in his monograph on Accum, "for years was the only laboratory of importance in England where students could obtain a practical knowledge of chemistry." It was the first school of chemistry to which students from the United States went in the early years of the nineteenth century. Among them were Prof. Benjamin Silliman Sr., of Yale, Prof. William Peck of Harvard and Prof. James Freeman Dana of Dartmouth.

Jean Baptiste Joseph Dieudonne Boussingault (1802-37) was born at Paris and educated at the School of Mines of St. Etienne. He then went to South America in the employ of an English mining company and on his return to France was appointed professor of chemistry at Lyons. In 1839 he became a member of the Institute and took the chair of agriculture in the Conservatoire des Arte et Metiers in Paris in 1839. He made and published many experimental investigations in general chemistry and agricultural science. The results of the latter were first collected in his *Economie Rurale* (2 volumes, issued in 1844) and afterwards in enlarged form in 8 volumes under the title *Agronomie, Chimie Agricole et Physiologie* issued between 1860 and 1891.

Justin von Liebig (1803-73) was born at Darmstadt, Germany, and educated in the universities of Bonn and Erlanger. In 1824 he became professor of chemistry at the University of Giessen and was transferred to the University of Munich in 1852. He established the first laboratory where students could get thorough practical training in chemistry to supplement lectures. Some students who afterwards became leaders in agricultural science in America were trained in his laboratory. He also introduced new methods of organic analysis and investigated many problems connected with plant and animal life. The importance of mineral fertilizers was established by his researches and this led to the founding of agricultural experiment stations. He published over 300 scientific papers and books. Among these were his *Chemistry in Its Application to Agriculture and Physiology*, issued in 1840, and *Animal Chemistry, or Chemistry in its Application to Physiology and Pathology*, in 1842. Liebig was greatly interested in the progress of agricultural chemistry in the United States and at one time seriously considered taking a position in this country.

Natural History

Georges Louis Leclerc de Buffon (1707-1788) was born at Montard, France, and in his earlier life studied mathematics, physics and agriculture. In 1739 he became a member of the Academy of Sciences and keeper of the Royal Gardens and Museum in Paris, out of which grew the Jardin des Plantes and the Museum of Natural History. He was not an investigator but rather a compiler and popularizer of scientific matters. He is best known by his great work entitled Histoire naturelle, generale et particuliere in 44 volumes (1749-1804) illustrated with good pictures. He was a fellow of the Royal Society of London and member of numerous scientific societies in Europe. Associated with Buffon in the preparation of the Natural History was Louis Jean Marie Daubenton (1716-1799), curator of the cabinet of natural history of the Academy of Sciences and professor in the College de France.

Zoology

In systematic zoology much advance was made by the work of Linnaeus on nomenclature and classification and the publication of his Systema Naturae (10th edition in 1758). George Cuvier (1769-1832) also contributed much through his connection with the Jardin des Plantes, which led to large collections by exploring parties in all parts of the globe from 1800 to 1832. He was also founder of the science of comparative anatomy and between 1800 and 1805 published Leçons d'Anatomie in 5 volumes.

Geology and Mineralogy

Geology and mineralogy, which had been included in the old natural philosophy, were beginning to take shape as distinct sciences in the latter part of the 18th century. Among the men who were giving special attention to these subjects at that time were Delisle and Abbé René Just Haüy (1743-1822) who were making studies in crystallography, and James Hutton (1726-1797) who presented the results of much research in a paper entitled Theory of the Earth, read before the Royal Society in 1785 and afterwards enlarged and published as The Theory of the Earth, with Proofs and Illustrations (1795). His views were combatted by Abraham Gottlob Werner (1749-1817), a German geologist and mineralogist who arranged data collected from many sources into an orderly system. William Smith (1769-1839), "the father of English geology", proved that stratified rocks show a definite order of succession, which may be determined by the included fossils. He published the first geological maps of England. He also wrote on Irrigation. William Maclure, who was born in Scotland but lived many years in the United States, was a merchant and geologist. (See also p. 12) In 1809 he read a paper on the geology of the United States before the American Philosophical Society and repeated this in 1817, at which time he presented the first geological map of the United States. The relation of mineralogy and geology to the study of soils and to agricultural chemistry was early recognized by those who were interested in agricultural education and research and these subjects were generally included in the programs proposed for the higher agricultural schools.

Botany

Carolus Linnaeus (Carl von Linné) (1707-1778), born at Rashult, Sweden, and from 1742 for 36 years professor of botany at the University of Upsala, brought order out of chaos in the science of botany by originating the modern system of botanical nomenclature and by greatly stimulating the collection of plants from all parts of the world. His *Species Plantarum* published in 1753 is now generally considered by systematic botanists as the starting point for modern rulings on nomenclature of plants. Long before his time plants were collected in botanic gardens for scientific study. One of the most important of these gardens is that established in 1633, as the Royal Garden, which afterwards became the famous Jardin des Plantes of Paris.

The Jussieu family of France included the following botanists:

1. Antoine de Jussieu (1686-1758), who ^{works} traveled in foreign countries, was professor at the Royal Garden, and published on anatomy, zoology and botany.
2. Bernard de Jussieu (1699-1776), educated in medicine, was demonstrator of botany at the Royal Garden in 1722 and superintendent of the gardens at Petit-Trianon from 1759. He traveled with Antoine and published works on botany and zoology.
3. Joseph de Jussieu (1704-1779), was also educated in medicine but became a botanist and engineer. He traveled and collected in South America (1735-1771).
4. Antoine Laurent de Jussieu (1747-1836) studied under Bernard, his uncle, and became assistant to Lemonnier, professor of botany at the Royal Garden. He published *Genera plantarum*, completed in 1789. He became professor of botany at the Jardin des Plantes in 1792 and was succeeded by his son, Adrien de Jussieu (1797-1853), a lecturer and writer on botany.

Little was done toward establishing the science of plant physiology until the 18th century when Koelreuter and Sprengel studied problems connected with the sexuality of plants, made experiments in hybridization and showed the relations of insects to pollination. About the same time Ingenhouse (1730-1799) showed that the living parts of plants absorb oxygen and evolve carbon dioxide. Among his publications were *Experiments on Vegetables* (1779) and *Essay on the Food of Plants* (1796). He also made researches in electricity.

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Nicholas Théodore de Saussure (1767-1845), a Swiss botanist, was the first to undertake a quantitative analysis of the nutriment of plants and shows "that plants not only fix carbon from carbon dioxide but also use the elements of water, which, with the mineral salts, are a necessary part of the food materials." His chief publication on plant physiology was *Recherches chimiques sur la végétation*, issued in 1804.

Henri Louis Duhamel du Monceau (1700-1781), born in Paris, made special studies in botany and arboriculture and became a member of the Academy of Sciences of Paris. "In company with Buffon, and also independently, he experimented in vegetable and animal physiology." His most important works are *Traité des arbres et arbustes, qui se cultivent en France en plein terre* (first edition in two volumes, 1755; second edition, with additions by others, in seven volumes, 1801-19); and *Traité des arbresfruitiers*.

Early Scientists in North America

America was a very attractive field for students of science, particularly natural history, and during the eighteenth century and the early part of the nineteenth there was a considerable number of men, either residents or travelers in this country, who devoted themselves to scientific work. In many cases they attracted the attention of the leaders in efforts for the improvement of education and agriculture and in person or through their writings had contacts with these leaders.

Among these early scientists, who were more or less associated with the agricultural movements, were the following:

Benjamin Smith Barton (1766-1815), was born at Lancaster, Pa., studied at Philadelphia, London, Edinburgh and Göttingen and became professor of natural history, botany and materia medica at the Philadelphia College. He published many papers on scientific subjects and some treatises, including "Elements of Botany" (1803).

John Bartram (1699-1777), born near Darby, Pa., was called by Linnaeus "the greatest natural botanist in the world". He was appointed American botanist to George III, sent large collections abroad and had many foreign visitors. In 1728, at the suggestion of Peter Collinson of London, he established near Philadelphia, at Kingsessing on the Schuylkill, a botanic garden, where he experimented with the collection of native American plants made on his extensive travels and by other means and disseminated numerous species to scientists and growers at home and abroad. He also imported many varieties of cultivated plants, the products from which were sold to enterprising planters like George Washington, who often visited the garden. He published papers in the Transactions of the American Philosophical Society and a book on his travels (1751) from Pennsylvania to Lake Ontario. His son, William Bartram (1732-1823), was a botanist and ornithologist. He prepared a list of American birds and a work on his travels in the South (1791). He was partner in the firm which carried on the business connected with the botanic garden for many years. Catalogues of a large number of species and varieties grown in the garden were published in 1807 and 1811.

Mark Catesby (1679-1749) was an English naturalist who visited America (1712-19) and published a Natural History of Carolina, Florida and the Bahama Islands (1722-26); Hortus Brittano-Americanus (1737) and Migration of Birds (1747).

John Clayton (1686-1773) was born in England but in 1705 emigrated to Virginia near Williamsburg and was clerk of Gloucester County for 51 years. He made extensive botanical studies and collections and published papers in the Philosophical Transactions of the London Royal Society. Linnaeus and Gronovius also published accounts of his specimens. He left two great manuscripts and a hortus siccus of Virginia plants but these were destroyed by fire.

Cadwallader Colden (1688-1776) was born in Scotland, graduated at Edinburgh in 1705, and came to America in 1708. He practiced medicine in Philadelphia 10 years and then settled in New York City. He was the first surveyor-general of New York and from 1761 Lieutenant-Governor. He studied the sciences, particularly botany, sent descriptions of several hundred American plants to Linnaeus and introduced his classification in this country.

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David Hosack (1769-1835) was born in New York, graduated at Princeton (1789), studied medicine in Philadelphia and Europe and became professor of botany at Columbia College in 1795. He undertook the establishment of a botanic garden in what was then the outskirts of New York City.

Peter Kalm was a Swedish botanist and traveler, who was a close friend of Linnæus. He was sent to America to make investigations in natural history and wrote *Travels into North America* (English Edition in 3 volumes, 1770-72).

Humphrey Marshall (1722-1801) was born at West Bradford (now Marshalltown) Pa., and became a stone mason but about 1748 turned to farming. He was interested in astronomy and built a small observatory. In 1773 he established a botanic garden of trees and herbaceous plants at Marshalltown and published *Arbustrum Americanum* (1785), a catalogue of trees and shrubs native in the United States.

André Michaux (1746-1802) was born near Versailles, France, studied botany under Bernard de Jussieu, traveled in England, Spain, Persia and Eastern North America (from 1785) but the French Revolution compelled his return to France. He established large nurseries near Charleston, S. C. and in Bergen County, N. J. His son, Francois André Michaux (1770-1855) was also in the United States, studied trees especially east of the Rocky Mountains and published 3 volumes about them (1810-13). He bequeathed \$8000 to the Massachusetts Agricultural Society for the purchase of land for experimental purposes, etc.

John Mitchill (died 1768) was born in England, emigrated to America about 1700 and lived at Urbana about 73 miles from Richmond, Va. He was educated in medicine but his chief interests were botany and history, though he also studied other sciences. In 1746 he carried more than 1000 specimens to England. He was highly regarded by Linnæus and other scientists and "carried on a very extensive correspondence not only with botanists but with prominent colonists in all parts of America". In 1744 he wrote on yellow fever and gave his paper to Franklin for his Philadelphia Society and later contributed a paper on electricity. He made an important map of North America in 1755 and accompanied it with a voluminous report on the condition of the colonies. He often wrote anonymously and was probably the author of a number of important works on the British colonies. Among these was *American Husbandry* by an American, published (1775) after his death. This is often credited to Arthur Young, who apparently prepared it for publication.

Joseph Priestley (1733-1804) was an English divine and physicist, who came to this country in 1794 and settled at Northumberland, Pa. Partly by the influence of Franklin he wrote a *History of Electricity* (1767) and later the *History and Present State of Discoveries relating to Vision, Light and Colors*. He made special studies of gases and discovered what is now called oxygen, as well as other gases.

Gerard Troost, a Dutch physician, chemist and geologist, came to America in 1810. He was the founder and first president of the Philadelphia Academy of Natural Sciences. He contributed a number of papers to the Philadelphia Society for Promoting Agriculture, among which was "A geological survey of the environs of Philadelphia", including the chemical composition of soils. In 1825 he became professor of chemistry, geology and mineralogy at the University of Nashville. In his account of geological surveys made by him in Tennessee he emphasized the relation of geology and mineralogy to soil formation.

EARLY AGRICULTURAL PUBLICATIONS IN EUROPE

During the 17th and 18th centuries a considerable literature on agricultural subjects was developed in a number of European countries. The writings of certain ancient authors were also available during this period, particularly Vergil, Columella, and Varro. The first printed book on agriculture was *Liber ruralium comodorum*, by Petrus Crescentius, published at Augsburg in 1471. (3)

In France early works of a practical character were the *Théâtre d'agriculture et ménage des champs* by Olivier de Serres, published in 1600, and *Les instructions pour les jardins fruitiers et potagers*, by La Quintini, gardener for Louis XIV at Versillles and Trianon. References have already been made to work bearing on agriculture by French scientists of the 18th century. The publication of writings on agriculture was much stimulated by the great work entitled *Encyclopedia ou dictionnaire raisonné des sciences, des arts, et des métiers* (1751-1780), commonly called "the Encyclopaedia", in 35 volumes. This contained articles on agriculture by the economist Quesnay. "Works on agriculture and horticulture became so numerous that critics published at Paris some pamphlets entitled *Preservatifs contre l'agromanie*".

In Great Britain agricultural literature is commonly said to have begun with "The Boke of Husbandrie" by Sir Anthony Fitzherbert, published in London in 1523. Before 1800 it is estimated that there were agricultural works by about 200 authors, including the "homely proverbial poem" by Thomas Tusser entitled "Five Hundreth Poyntes of Good Husbandry, United to as Many of Good Huswifery", published in 1573.

Among later works, much importance is attached to Jethro Tull's "Horse-Hoeing Husbandry or a Treatise on the Principles of Tillage and Vegetation", (107) three editions of which were published between 1733 and 1751. The author, educated at Oxford and in law at Gray's Inn, had settled on a farm at Howberry in 1699, where he undertook to plant grain in rows by hand labor. When the laborers objected to this as a toilsome innovation, he attempted to make implements which would do work "more faithfully than such hands would do." An outcome of his experiments was the invention of the drill to be drawn by horses about 1700. He also made plows and horse-hoes. Referring to this Tull says, "I took the first hints of my horse-hoeing culture from the ploughed vineyards near Frontignan and Setts in Languedoc". His book treats of his experiences on his farm and also discusses agricultural practice more broadly, combatting traditional views which he sums up under the term "Virgilian husbandry". Its publication piecemeal led to much public criticism from the adherents to the old methods but also to important changes in soil management.

In 1784 Arthur Young (1741-1820), who was born in London but took up farming in 1763, began the irregular publication of a periodical which was destined to have a great influence on the advancement of agriculture in Europe and America. In his preface to Volume I of these "Annals of Agriculture and Other Useful Arts", Young explains the origin and purpose of this work.

"The idea of a periodical published as a general channel for information to agriculture is at least a century old. Houghton in King James the Second's reign published a paper for this purpose twice a week and continued it with little interruption to the beginning of Queen Anne's." (118)

John Houghton, a citizen of London and fellow of the Royal Society, published at irregular intervals between 1681 and 1683 "a collection of letters for the improvement of Husbandry and Trade" and from 1692 to 1703 the periodical referred to by Young, entitled "Husbandry and Trade Improved".

Young had proposed such a publication as the Annals before the Revolutionary War and began it shortly after its close in the hope that agriculture in Great Britain would be developed so that that country could depend "more on the basis of internal resources". An important feature in this periodical was to be an account of observations and experiments by the editor and others.

AGRICULTURAL SOCIETIES IN EUROPE

The first agricultural society in Germany was established in 1764. In France there was an early Society of Agriculturists. This was succeeded by the Academy of Agriculture of France, which began the publication of proceedings as early as 1761. In Russia the Free Economical Society was established by the Empress Catherine in 1765, with a large experiment farm near St. Petersburg.

The Society for the Encouragement of Arts, Manufactures and Commerce organized in London in 1754 included agriculture in its program. This was followed by an organization formed at Bath, Sept. 8, 1777, which was first called the Society of Bath for the encouragement of Agriculture, Arts, Manufactures and Commerce. In 1790 its name was changed to the Bath and West of England Society for the purposes above stated. Its first volume of "Letters and Papers on Agriculture" etc. was published in 1780. ⁽¹²⁾ This was followed by 13 others up to 1816, when publication was suspended until in 1829 part of ⁽¹¹⁾ Volume 15 was issued. Volume 1 of a new series appeared in 1853. ⁽¹¹⁾ The volumes of the earlier series contained numerous articles not only on crops and their culture and on breeds of live stock and their care and feeding, but also on a great variety of other subjects including such topics as plans of cottages for laborers, the poor rates, prevention of poverty, abuse of spiritous liquors, application of chemistry to agriculture and rural economy, etc.

In Scotland the first organization was the Society of Improvers in the Knowledge of Agriculture in Scotland, begun in 1723 and continued for more than 20 years. Its published record is contained in a volume of "Select Transactions" issued in 1743.

In 1784 persons interested in the development of the agriculture and other industries of the Highlands of Scotland met informally at Edinburgh to consider the formation of an organization and after several meetings adopted a constitution, entitled Regulations of the "Highland Society of Scotland", in January 1785. The objects of the Society were stated to be: (1) Inquiry into the Status of the Highlands and Islands of Scotland; (2) Means of improvement by establishing towns and villages, by facilitating communication by roads and bridges, by advancing agriculture, extending fisheries, and introducing useful trades and manufactures, by uniting the efforts of proprietors, and by calling the attention of the government toward encouragement and prosecution of these beneficial purposes;

(3) Promotion of the language, poetry and music of the Highlands. A Royal Chapter for this Society was obtained in 1787, together with its first parliamentary grant of 3000 pounds, the interest of which was to be spent for essays, inventions and improvements in agricultural crops, etc. The annual dues of members were fixed at one guinea, besides 2 shillings and sixpence for salaries and petty expenses. This Society grew rapidly and by 1803 we are informed in its published Transactions that since its membership included persons from different parts of the country it is becoming a society for all Scotland. In this capacity it has continued to the present time. Its first volume of "prize essays and transactions" was published in 1799 and similar volumes appeared at irregular intervals thereafter, there being only six up to 1824. (61) These deal with crops and animals but also with roads, bridges, canals, fisheries, navigation, fuel, peat, irrigation, drainage, machinery, improvement of waste lands, equalization of weights and measures, savings banks, distilleries and the laws relating thereto, inventions relating to agriculture, etc. The Transactions issued in 1824 record the institution by the Society of itinerant lectures on veterinary medicine and farriery, illustrated with demonstrations, and of experiments with salt as a fertilizer and in feeding.

In Ireland The Dublin Society for Improving Husbandry, Manufactures and other Useful Arts was founded in 1731 and began in 1737 to publish Weekly Observations. In 1746 it received a grant of £500 a year from the government and was incorporated in 1750 as the Royal Dublin Society.

In their organization and work the early American Agricultural Societies were greatly influenced by the examples set by the societies in Great Britain.

THE BRITISH BOARD OF AGRICULTURE

The British Board of Agriculture was established under an Act of Parliament in 1793. Its first president was Sir John Sinclair (1754-1835), who held this office for 13 years. He was a Scotch publicist and lawyer, educated at Edinburgh, Glasgow and Oxford, and a member of parliament most of the time from 1780 to 1811. He was very active in the promotion of the agricultural interests of Great Britain and under his guidance the Board of Agriculture did much useful work. He was the author of an elaborate "Statistical Account of Scotland" in 21 volumes (1791-1799) and conducted a very extensive correspondence with many important individuals, including George Washington, two volumes of which were published in 1831.

The functions of the Board, as stated by its president, in a formal address to it in 1797 were as follows:

1. "Collecting, printing and circulating information on agricultural and other important subjects, connected with the internal improvement of the country."
2. "Making, under the inspection of the Board itself, or a Committee of its members, useful experiments in agriculture."
3. "Submitting to the consideration of Parliament, such regulations as may tend to promote the general improvement of the country and recommending to its attention such useful discoveries, of an agricultural nature, as may be entitled to public reward." (98)

~~As one of the first pieces of work the Board undertook the preparation~~

As one of the first pieces of work the Board undertook the preparation of a somewhat elaborate report on "the present agricultural state of the country and the means of its improvement", which involved in part what would now be called an agricultural survey of the different counties of the kingdom. Within four years the reports for some counties were completed and printed. Much interesting material in the form of communications to the Board from a variety of sources had been collected and a first volume of these had been printed. Among other things a treatise "on the subject of manures" by Robert Somerville of Haddington and "an account of experiments tried by the Board of Agriculture in the composition of various sorts of bread" had been published in 1795. Experiments with manures had also been undertaken and a "Bill of Inclosure" had been submitted to Parliament.

In the address above cited the president of the Board refers with evident satisfaction and as an indication of the Board's usefulness to the recommendation of Washington in 1796 to Congress that a similar board be created for the United States. (p.115)

GOVERNMENTAL RELATIONS TO EDUCATION IN THE AMERICAN COLONIES AND EARLY STATES

The granting of federal and state lands and funds for agricultural education was the result of public policies relating to education which passed through a long period of evolution. It has therefore seemed desirable to trace this in outline in connection with the discussion of the foundations of our present system of agricultural education.

Beginnings of the American Public School System

The use of public lands and funds for the encouragement and support of educational institutions began early in the American colonies. At times and in certain places it encountered much opposition. The doctrine that the parent was responsible for the education of the child and therefore should pay for his schooling was long used to hinder the public support of education, especially as regarded primary and secondary schools. For many centuries in the old world the church, rather than the

State, was looked to as the proper authority under which public education should be conducted as far as this was at all desirable and the support of education was classed among works of charity. Higher education in particular was primarily for the training of ecclesiastical leaders and hence colleges and universities came naturally under the control of the church. The union of church and State, so generally prevalent in European countries, and transferred to the American colonies, made it comparatively easy at first to use public lands and funds in this country for the support of the higher educational institutions. As the separation of the State from the church developed, and particularly after the Revolution when this separation was defined in State and national constitutions, a strong sentiment was created against public control of higher education. On the other hand, it became more difficult to use public funds for the maintenance, even in part, of institutions controlled by particular denominations. There was considerable ebb and flow in this sentiment and in the different States it was modified from time to time by the racial and denominational make-up of the population. In considering the history of the movement which finally resulted in the establishment of State colleges and universities, including those in which agriculture is taught, it is very desirable to take into account the general progress of public support for education. A brief resumé of this general educational movement is therefore given in this chapter.

In general, the English system of schools was transferred to this country by the early colonists from Great Britain. This included the elementary or "dame school", the "grammar" or secondary school, and the college. The elementary schools were at first privately maintained by tuition or in part by voluntary contributions but in New England soon began to receive public money through the action of the town meetings. The first school in America to receive public funds by vote of the town was established in Dorchester, Massachusetts, in 1639. In this case the money was obtained from rental charges imposed on people occupying land belonging to the town. On January 1, 1645, the town meeting at Dedham, Massachusetts, voted unanimously to raise twenty pounds for the maintenance of a free school.

"Many of the New England schools received their support from a variety of sources, such as the sale or rental of public lands, rental from fish weirs, from ferries, from bequest and private gift; from subscription, from local rates, and in nearly all cases from tuition of students."

"The Grammar School of the American colonies was a transplanted English public school, now, however, for the most part supported and controlled by the colonies and the local town governments. Only rarely did it receive a foundation by bequest, and even more rarely was it founded by religious or private association. The curriculum, the method, and the purpose were almost identical with those of their English prototypes. Such schools were to be found in all the colonies, with the exception of Georgia and North Carolina, but were most numerous in the New England colonies where the religious motive was prominent and where colleges demanding the preparatory grammar training were influential. In Massachusetts, Connecticut, and Maryland, systems of such schools existed, and in the first of these colonies such schools were established in considerable number. The first of these in America was the Boston Latin School, founded in 1635, with a continuous existence to the present time." (79)

In 1647 the Massachusetts Bay Colony passed a general law requiring that an elementary school should be established in every town of fifty families, and a Latin School in every town of 100 families. A similar law was passed by the Connecticut Colony in 1650. On this basis many schools were established in the New England colonies during the next 100 years.

About 1700 when community centers of population had become established in many towns, while means of transportation remained very inadequate, a demand arose for the equalization of school privileges. To satisfy this demand the elementary school was sometimes moved about and held for a short period in from two to six places in the town during the year. This "moving school" led to the creation of permanent school districts.

Then occurred a decline in interest in education due to difficulties arising from religious differences, political unrest culminating in the Revolution, and the circumstances due to war. "At the close of the Revolution scarcely a Latin grammar school worthy of the name remained in New England." Only in a few of the leading towns was a serious attempt made to reorganize such schools." (Origin and Development of the High School in New England, E. D. Grizzell)

The Latin Schools, as a rule, proved too narrow in their curriculum to satisfy the people generally and were supplanted by private institutions known as "academies". The little communities within the towns strove with each other for the establishment of "district schools", which became too numerous and feebly supported. This condition went from bad to worse until the educational reform led by Horace Mann which began in 1835.

Outside of New England support of education with public funds was chiefly confined to the higher institutions and the establishment of general systems of public schools was long delayed.

Public Support of Early American Colleges

The colleges in the American Colonies and some of the States formed early in the history of the United States in many cases received public aid through grants of land or money. A number of these institutions became land-grant colleges after the passage of the Morrill Act of 1862.

Pennsylvania

An interesting development of educational plans by Benjamin Franklin (1706-1790) led the way to a broader conception of the duty of the public to education and to a realization of the need of institutions more closely related to the occupations in which most of the people are engaged. Franklin came from Massachusetts in 1723 and though he had not had a college education appreciated the advantages of the educational system which had its largest development in Boston and vicinity. He realized that this could not be at once transferred to Pennsylvania and moreover his practical mind led him to desire a somewhat broader system. His education had come principally from observation, reading, literary efforts, and the pursuit of the printer's trade and other practical business. His reading had been very broad and comprised much which related to philosophy, science, education and industries, including agriculture. He was active in observing and experimenting along scientific lines, but his chief interest in science was after all for utilitarian purposes.

His observations before his twentieth year having taught him the advantages to be derived from ingenious acquaintance, he organized the famous club called the "Junto" after his return from his first visit to England (1724-26). This was limited to 12 members, who were to discuss morals, politics and natural philosophy. They needed more books than they could personally own. Franklin, therefore, undertook to organize a library by getting subscriptions from his friends. This was a success, a charter was obtained and thus the library became a permanent institution in Philadelphia and "the mother of all the North American subscription libraries", which even in Franklin's time became numerous and eventually in many cases led to the establishment of public libraries. In 1729 he took charge of the publication of the Pennsylvania Gazette and in 1732 issued the first number of Poor Richard's Almanac.

Every ten years he visited Boston and after one of these visits he said that while he was on the whole satisfied to remain in Pennsylvania he regretted that in that State there was "no provision for defense nor for the more complete education of youth, no militia, nor any college. I, therefore, in 1743 drew up a proposal for establishing an Academy", but under conditions then existing was compelled to "let the scheme lie awhile dormant". He "succeeded better the next year, 1744, in proposing and establishing a Philosophical Society". (475) (p. 73)

In 1749 Franklin revived the educational project and issued a pamphlet entitled "Proposals Relating to the Education of Youth in Pennsylvania". How he came to make these proposals he explains as follows:

"OBSERVATIONS RELATIVE TO THE INTENTION OF THE ORIGINAL FOUNDERS OF THE ACADEMY

In PHILADELPHIA, JUNE, 1789. Having acquired some little reputation among my fellow-citizens by projecting the public library in 1732, and obtaining the subscriptions by which it was established, and by proposing and promoting with success sundry other schemes of utility in 1749, I was encouraged to hazard another project, that of a public education for our youth. As in the scheme of the library I had provided only for English books, so in this new scheme my ideas went no further than to procure the means of a good English education. A number of my friends to whom I communicated the proposal concurred with me in these ideas; but Mr. Allen, Mr. Francis, Mr. Peters, and some other persons of wealth and learning, whose subscriptions and countenance we should need, being of opinion that it ought to include the learned languages, I submitted my judgment to theirs, retaining, however, a strong prepossession in favor of my first plan, and resolving to preserve as much of it as I could, and to nourish the English school by every means in my power.

Before I went about to procure subscriptions, I thought it proper to prepare the minds of the people by a pamphlet, which I wrote, and printed, and distributed with my newspapers, gratis.

PROPOSALS RELATING TO THE EDUCATION OF YOUTH IN PENNSYLVANIA

The good education of youth has been esteemed by wise men in all ages, as the surest foundation of the happiness both of private families and of commonwealths. Almost all governments have therefore made it a principal object of their attention, to establish and endow with proper revenues such seminaries of learning, as might supply the succeeding age with men qualified to serve the public with honor to themselves and to their country.

SUBJECTS TO BE TAUGHT IN THE ACADEMY

As to their studies, it would be well if they could be taught, everything that is useful, and everything that is ornamental. But art is long, and their time is short. It is therefore proposed, that they learn those things that are likely to be most useful and most ornamental; regard being had to the several professions for which they are intended.

Writing; drawing; arithmetic; accounts; geometry; astronomy; English grammar, literature, composition; reading; speaking; history in a broad way, including the history of commerce, inventions and manufactures; geography; chronology; morality; Latin; Greek; Modern languages; (these last three subjects to be elective for some students, but theological students should have Latin and Greek; for physic, the Latin, Greek and French; law students, Latin and French; and merchants, French, German and Spanish); Natural history.

While they are reading natural history, might not a little gardening, planting, grafting, and inoculating, be taught and practiced; and now and then excursions made to the neighboring plantations of the best farmers, their methods observed and reasoned upon for the information of youth? The improvement of agriculture being useful to all, and skill in it no disparagement to any.

That a house be provided for the Academy, if not in the town, not many miles from it; the situation high and dry, and, if it may be, not far from a river, having a garden, orchard, meadow, and a field or two.

That the house be furnished with a library if in the country, (if in the town, the town libraries may serve), with maps of all countries, globes, some mathematical instruments, an apparatus for experiments in natural philosophy, and for mechanics; prints, of all kinds, prospects, buildings, and machines."

Meanwhile a movement had begun in Philadelphia which proved to be a factor in advancing Franklin's scheme for an Academy. In William Penn's Frame of Government for the Province of Pennsylvania it was provided that

"The governor and provincial council shall erect and order all public schools, and encourage and reward the authors of useful sciences and laudable inventions in the said province *** And *** a committee of manners, education and arts, that all wicked and scandalous living may be prevented, and that youth may be successively trained up in virtue and useful knowledge and arts." (91)

The first movement to establish an educational institution of a high grade was in the action of the Executive Council which proposed, November 17, 1683, "That Care be Taken about the Learning and Instruction of Youth, to wit: A School of Arts and Sciences." It was not until 1689, however, that the "public Grammar School" was set up in Philadelphia. This institution, founded upon the English idea of a "free school", was formally chartered in 1697 as the "William Penn Charter School". It was intended as the head of a system of schools for all, rather than a single school for a select few. The government of the Province, however, lost interest in education and this school had to be maintained under private auspices.

In 1740 a Charity School was established in Philadelphia by public-spirited citizens and this was drawn into the movement for an Academy. Franklin was so successful in getting friends for his scheme that soon a board of trustees was organized and a considerable sum of money was collected by gifts and lotteries. Application was then made to the Common Council of Philadelphia for aid and the Council agreed to give funds, with "the right of sending one scholar each year from the Charity School to the Academy". The Charity School had a new building but was heavily in debt. The trustees of the Academy were able to purchase this, on condition that a charity school should be maintained there and this was done until 1877.

On January 7, 1750, the Academy was opened, with three schools, the Latin, the English and the Mathematical, but for many years the English School was starved by the trustees, much to the disgust of Franklin who protested vigorously in public and private. A charter for the Academy was obtained July 13, 1753, which was amended May 14, 1755 to give authority for instituting a college or "seminary of universal learning" with the privilege of conferring degrees. A school of philosophy had meanwhile been established and this together with the Latin School constituted the College, while the Academy consisted of the English and Mathematical Schools.

William Smith (1727-1803), a native of Scotland and graduate of the University of Aberdeen in 1747, who had come to America in 1751, and had been a tutor in Governor Martin's family on Long Island, joined the teaching staff of the Philadelphia institution and became its provost in 1754. (473) His liberal plan of education was adopted. For the school of philosophy under this plan the curriculum leading to the A. B. degree covered three years and included Latin, Greek and mathematics, but also logic, rhetoric, history, political science, ethics, natural history, chemistry, physics and astronomy. The course in chemistry was given in the third year and included the "chemistry of fossils and of agriculture". (474) In 1765 the College established the first medical school in America. In this school Dr. Benjamin Rush became the first American professor of chemistry in 1769. During the Revolutionary War the College was accused of siding too much with Great Britain and in 1779 the legislature revoked its charter and created a new corporation entitled "The Trustees of the University of the State of Pennsylvania". Dr. Smith withdrew from the college but returned as provost in 1789. Meanwhile he had been president of Washington College in Maryland, which he had aided in founding. After futile attempts to carry on two separate institutions they were combined in an act of September 30, 1791, which created "The Trustees of the University of Pennsylvania", who were authorized to employ professors in the arts and sciences and in law, medicine and divinity. This act provided that the Governor of the State should be one of the trustees and that an annual statement of funds should be made to the legislature. State funds were loaned to the University and by an Act of March 19, 1807, the sum of \$3,000, "out of the monies they owe the State" was granted to the Trustees for the purpose of enabling them to establish a garden for the improvement of the science of botany and for instituting a series of experiments to ascertain the cheapest and best food for plants and their medicinal properties and virtues.

Franklin's influence on education is also seen in the Constitution of Pennsylvania of 1776, framed by a convention of which he was president. This provided under the "Plan or Frame of Government", Section 44:

"A school or schools shall be established in each county by the legislature, for the convenient instruction of youth, with such salaries to the masters paid by the public, as may enable them to instruct youth at low prices: And all useful learning shall be duly encouraged and promoted in one or more universities." (91)

Vermont

In Vermont this constitution was in the hands of the men who drafted the first constitution of the State of Vermont at a convention held at Windsor, July 2 and December 24, 1777. The document adopted by this convention was very largely a copy of the Pennsylvania constitution. Its provision for education was as follows:

"Plan or Frame of Government. - Section XL. A school or schools shall be established in each town, by the legislature, for the convenient instruction of youth, with such salaries to the masters, paid by each town; making proper use of school lands in each town, thereby to enable them to instruct youth at low prices. One grammar school in each county, and one university in this State, ought to be established by direction of the General Assembly." (91)

It appears that the support of a university by the State was opposed especially by the friends of Dartmouth College, and as a result this provision was omitted in the constitution of 1786. It being evident that the time had not arrived for State universities in New England, a brother of Ethan Allen, Ira Allen, who was very influential in the public life of Vermont at that time, went ahead and procured from the legislature a charter for a University of Vermont in 1791, and by vote of the legislature this was established at Burlington on its present site. Ira Allen made a very generous subscription toward its foundation but financial and other difficulties prevented its beginning instruction until 1800 and for the first nine years the president and one tutor constituted the faculty. This institution became one of the land-grant colleges in 1865 and maintains a College of Agriculture and an experiment station. It has, however, never been a State University in a complete way.

Massachusetts

In Massachusetts in connection with the founding of Harvard College, in 1636, at Cambridge, the General Court of the Massachusetts Colony agreed to give the institution £400. This was the first assembly "in which the people by their representatives ever gave their own money to found a place of learning".

Rev. John Harvard, who had come from England to Charlestown, Massachusetts, in 1637, at his death soon after left £800 and his library of 320 volumes to the college. Out of gratitude the General Court voted that the new institution should bear his name.

The course of study fixed by Rev. Henry Dunster, who first had the title of president, in 1640, was quite comprehensive and liberal for the times, including lectures on physics and the "nature of plants". This course covered 3 years but was extended to 4 years about 1655.

In 1642 the General Court created a governing board of overseers, which had as ex-officio members the governor and deputy governor of the Colony and "magistrates in the jurisdiction". Apparently the first money voted by the Court was for some reason "never specifically paid". In lieu of this, it gave in 1640 and following years, the income of the ferry between Charlestown and Boston, and at a later date (1659) an annual grant, at first of £100 and afterwards of £150, for the support of the president. In 1669, "besides private contributions, 44 towns sent their quota" toward a new college building. From 1650 to 1780 the college received from the legislature \$56,854 and 4,300 acres of land. In 1814 on petition of the trustees of the New England Colleges a bank tax was created to be divided between Harvard, Bowdoin and Williams Colleges. Harvard received \$10,000 annually for ten years. "This was the first and only grant of money by the legislature to the College after the formation of the State government."

Williams College, at Williamstown, Massachusetts, had been chartered in 1793 and had received from the legislature \$4,000 "for the purchase of books and philosophical apparatus". The legislature also gave this college grants of land and otherwise aided it from time to time.

Bowdoin College, the other institution to receive the benefits of the bank tax, had been chartered in 1794 and was located at Brunswick, Maine, then a district of Massachusetts. Five townships were also given to this college.

The constitution of Massachusetts, framed in 1780, under the leading influence of John Adams made broad provision for the encouragement of educational institutions. It contains a chapter specifically relating to the "University of Cambridge", and "Encouragement of Literature, etc." This confirms the previous charters regarding the rights, privileges, funds, lands, etc. of Harvard College, and continues the Board of Overseers with the "governor, lieutenant governor, council and senate of this Commonwealth" as their successors, provided that the legislature reserves the right to make "alterations in the government of the said University".

In Section 2 of this chapter, provision is made for the public support of schools, societies, and other institutions in the following language:

Section II. The encouragement of Literature, etc. Wisdom and knowledge, as well as virtue, diffused generally among the body of the people, being necessary for the preservation of their rights and liberties, and as these depend on spreading the opportunities and advantages of education in the various parts of the country and among the different orders of the people, it shall be the duty of legislators and magistrates, in all future periods of this Commonwealth, to cherish the interests of literature and the sciences and all seminaries of them, especially the university at Cambridge, public schools and grammar schools in the towns; to encourage private societies and public institutions, rewards and immunities for the promotion of agriculture, arts, sciences, commerce, trades, manufactures, and a natural history of the country; to countenance and inculcate the principles of humanity and general benevolence, public and private charity, industry and frugality, honesty and punctuality in their dealings, sincerity, good humor, and all social affections and generous sentiments among the people. (91)

Charles Francis Adams gives an interesting statement regarding the origin of this general education clause in the Constitution of 1780, quoting an account given him by his grandfather, John Adams, in 1809.

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It seems that in traveling from Boston Philadelphia John Adams had become much interested in a "curious collection of birds and insects of American production". This collection, he says, was so singular a thing that it made a deep impression upon him and he "could not but consider it a reproach to my country that so little was known even to herself of natural history". When he was in Europe, along with Franklin, as a member of the Commission to the King of France, he saw many other collections and heard much praise of the philosophical Society at Philadelphia, and on his return in 1779 proposed "that the future legislature of Massachusetts institute an Academy of Arts and Sciences", which was done by the first legislature under the new Constitution. This was the American Academy of Arts and Sciences, incorporated in 1780, which published its first memoirs in 1785.

At the convention for forming the Constitution of Massachusetts, Adams was appointed on a subcommittee to draft the constitution and said that his mind and heart were so full of this subject that he inserted the second section of chapter 5 on the Encouragement of Literature, etc.

New Hampshire

In New Hampshire, Dartmouth College, at Hanover, originated in Moor's Indian Charity School at Lebanon, Conn., about 1750, which was later removed to New Hampshire. Money for this school was raised in England and Scotland and these funds were held by a Board of Trustees of which the Earl of Dartmouth was Chairman.

Largely through the influence of Governor John Wentworth of New Hampshire, large tracts of land were given by that province to the school at Hanover and in 1769 George III granted a royal charter to "Dartmouth College". The Charity School was maintained in close connection with the College until 1849. After the Revolution other grants of land were made to this college by the New Hampshire legislature and in 1785-6 the legislature of Vermont gave it a township.

Questions having arisen regarding the legal status of this institution, the legislature in 1816 attempted to take control of the college. This led to the famous suit in the Supreme Court of the United States in which Daniel Webster for the college persuaded the Court that the original charter constituted an inviolable private trust. Without doubt the outcome of this suit, which excited general interest throughout the country at that time, had much to do with crystallizing public sentiment, especially in the East, against the support of colleges with public funds. (See also p.384)

Rhode Island

In Rhode Island Brown University received its charter from the General Assembly in 1764, and was opened at Warren in 1765 as Rhode Island College. No grants of land or appropriations were given to this institution.

This college was removed to Providence in 1770 and in 1804 was renamed in honor of Nicholas Brown. (See also p.384)

New York

In New York, as early as 1702, suggestions were made for the founding of a college on the "King's Farm" in New York City. (331) This matter came up again in 1729 but no action was taken until 1746 when the General Assembly voted for a lottery for this purpose. As a result of this and other acts a considerable amount was raised and in 1751 was committed to a board of trustees. In 1754 a charter for King's College was granted by King George II, who also gave land and money for the college. Funds for its support prior to the Revolution were provided "by State assistance, by private donations, by lotteries and by tuition".

The college work was interrupted during the Revolutionary War but at its close the surviving remnant of the governors "petitioned the Legislature to erect the College into a University". On May 1, 1784, the legislature passed "An Act for granting certain privileges to the College heretofore called King's College, for altering the name and charter thereof, and erecting an University within this State."

"By this Act was created a 'body corporate and politic' styled the Regents of the University of the State of New York, of whom the Governor, the Lieutenant-Governor, the President of the Senate for the time being, the Speaker of the Assembly, the Mayor of the City of Albany, the Attorney-General and the Secretary of the State respectively for the time being' were constituted Regents by reason of their offices, together with twenty-four gentlemen designated by name, and representatives of the 'respective religious denominations in this State to be chosen by the clergy thereof'." (331)

The Regents were "impowered to found schools and colleges in any such part of the State as may seem expedient to them and to endow the same." The name of King's College was changed to Columbia College. An amendatory Act passed November 26, 1784, authorized the State Treasurer to advance £2552 to the College. Government of the College by the Regents did not prove satisfactory for several reasons among which was the fact that it seemed to many people of that day to involve too much state control. A compromise Act passed April 13, 1787, made "The Regents of the University of the State of New York a corporation with power to visit and inspect all the Colleges, Academies, or Schools which are or may be established in the State" and restored the separate Board of Trustees for Columbia College. This became a self-perpetuating board and the College has since remained under private control.

After the separation the legislature made several grants of money in small amounts to the college, including about \$75,000 for the purchase of 20 acres now in the heart of New York City, where Dr. Hosack had attempted "to establish a botanical garden subservient to the purposes of medicine, agriculture, and the arts", but had not been able to carry out his plans.

On April 12, 1792, largely as the result of efforts by the newly established Society for the Promotion of Agriculture, Arts and Manufactures, the New York legislature granted £750 for five years to the trustees of Columbia College for additional professorships. Under this act a professorship of Natural History, Chemistry and Agriculture was established and Dr. S. L. Mitchill was appointed to fill this position with a salary of £200 a year. An account of him and his work will be given later in connection with the history of agricultural societies in New York. (See p. 90)

Union College, at Schenectady, received its charter from the regents of the university in 1795. From that year until 1804 the college received from the State several grants of money and land, from which \$78,112.13 were derived. In 1805 and 1813 lotteries authorized by the legislature yielded \$280,000.

Hamilton College at Clinton, developed in 1812 out of an academy chartered in 1793, received \$50,000 in bonds in 1812, \$40,000 under the lottery act of 1814 and beginning with 1836 an annual appropriation of \$3,000 for 10 years.

New Jersey

In New Jersey the College of New Jersey, now Princeton University, received its first charter in 1746 and a more complete charter in 1747, from the Province of New Jersey. No public funds or land were given to any college in this State. It was opened for students in 1747 and permanently located at Princeton in 1756. The title of the Corporation was not changed to Princeton University until 1896.

Queen's College, now Rutgers College, at New Brunswick, received royal charters in 1766 and 1770, and began instruction soon after receiving the second (314) charter. In 1825 its name was changed to Rutgers College, in honor of Colonel Henry Rutgers of New York, one of its generous supporters. (See also p. 384)

Maryland

In Maryland, Governor Francis Nicholson in 1694 secured the passage of an act under which duties on furs and other exports were to be used for the maintenance of free schools.

In 1698 King William's School was established at Annapolis and continued until 1784 when it was merged in St. John's College. Before 1700 Dr. Bray established libraries, especially for the clergy. The provincial library at Annapolis had 1,100 volumes and was then the largest collection in the English colonies. An Act of 1723 encouraged the establishment of grammar schools in each county. Dr. William Smith went from the presidency of the Philadelphia College to become principal of the Kent County Academy, with which the Free School of Chestertown founded in 1723 had been merged. He was influential in the securing of a charter in 1782 for Washington College as the beginning of a University of Maryland and this was furthered in 1784 by providing in the charter of St. John's College at Annapolis for a nominal connection with the University. State appropriations were given annually to these colleges for over 20 years but were withdrawn in 1805 as the result of a movement inaugurated in 1796 by Rev. Samuel Knox, principal of Frederick County Academy. He published an outline of a complete school system for the State, under the title of "Principles of Education". Jefferson is said to have got from him many ideas utilized in his plan for the University of Virginia. Knox was invited by him to take a professorship in that institution but his interest was in academies rather than colleges and he persuaded the State to give its funds to these secondary schools. In 1805 the University of Maryland also ceased to exist but in 1812 a new institution with this name was incorporated and the following year a lottery was granted by the State for its benefit. This was the origin of the present University of Maryland. (p.258)

Virginia

In Virginia, proposals were made in 1617 for a college, with preparatory schools. These were taken up in 1619 by Sir Edwin Sandys, president of the Virginia Company in England, and the company made a grant of 10,000 acres of land, of which 1,000 acres were for an Indian school and the remainder for "the foundation of a seminary of learning for the English". "Tenants were sent over to occupy the university lands", together with a member of His Majesty's Privy Chamber to be superintendent of the institution. The Indian Massacre of 1622 put an end to this movement. In 1624 an island in the Susquehanna River, near what is now Havre de Grace, Maryland, was granted for "Foundinge and maintenance of a university and such schools in Virginia as shall there be erected and shall be called Academia Virginiensis et Oxoniensis". In 1660 the Colonial Assembly of Virginia voted "that for the advance of learning, education of youth, supply of the ministry, and promotion of piety, there be land taken upon purchases for a Colledge and free schools." In 1691 the Assembly sent Rev. James Blair, representative of the Bishop of London, to England to secure a charter for the college. Queen Mary and her consort William favored this proposition and agreed to give £2,000 out of quit-rents in Virginia. The government also gave £2,000, 20,000 acres of land, a tax of a penny per pound on tobacco exported from Maryland and Virginia and the fees and profits of the surveyor-general's office. The charter issued February 19, 1693, was for "a certain place of universal study, or perpetual college, for Divinity, Philosophy, Languages, and other good Arts and Sciences, consisting of one President, six masters or professors, and one hundred scholars, more or less, graduates and non-graduates." (495) The college was to be governed by a self-perpetuating board of 18 trustees. Mr. Blair was made the first president and served 50 years. He also represented the Bishop of London as Chancellor of the College.

By 1700 this college, named for William and Mary and located near the church in "Middle Plantation old fields", was able to hold its first commencement and in 1729 had a faculty consisting of the president and six professors. The town of Williamsburg was established in 1705 near the college and made the capital of the colony. Before the Revolution, the college was liberally supplied with funds including valuable property in England and certain public revenues.

In 1693 the Virginia House of Burgesses levied an export duty on skins and furs for the benefit of the college and in 1718 gave £1,000 for the education of Virginia youth. Later they also granted taxes on tobacco, imported liquors and pedlars.

In 1779 Thomas Jefferson, then a member of the General Assembly of Virginia, introduced his famous bills for the establishment of a general system of education in that State. These included provisions for elementary and secondary schools, a library and a university. Public sentiment in Virginia at that time did not favor such liberal legislation and the bills were not passed. He states that the second bill "proposed to amend the constitution of William and Mary College, to enlarge its sphere of science, and to make it, in fact, a university". He explains that this could not be done because the college "was an establishment purely of the Church of England" and was not well located.

Becoming Governor of Virginia and one of the visitors of the college that same year, he effected a "change in the organization of that institution, by abolishing the grammar school and the two professorships of divinity and oriental languages, and substituting a professorship of law and police, one of anatomy, medicine, and chemistry, and one of modern languages; and the charter confining us to six professorships, we added the law of nature and nations and the fine arts, to the duties of the moral professor, and natural history to those of the professor of mathematics and natural philosophy." (495)

The removal of the capital to Richmond at that time weakened the influence of the college.

Washington received his surveyor's license from this institution and in 1788 became its chancellor. Among its alumni were Jefferson, Monroe, John Marshall and others influential in the early movements for the improvement of agriculture and the arts through experiments and education.

In 1760 Thomas Jefferson became a student in William and Mary College, and stayed there two years. In his autobiography Jefferson states that the course of his life was largely determined by the influence of one of the professors at this college.

"It was my great good fortune, and what probably fixed the destinies of my life, that Dr. William Small of Scotland was then professor of mathematics, a man profound in most of the useful branches of science, with a happy talent of communication, correct and gentlemanly manners, and an enlarged and liberal mind. He, most happily for me, became soon attached to me, and made me his daily companion when not engaged in the school; and from his conversation I got my first views of the expansion of science, and of the system of things in which we are placed." (496)

Jefferson formed a great liking for the study of natural science, especially botany, and this continued throughout his life.

He also early had a broad view of education and the need of a comprehensive system of education largely maintained at public expense.

In both public and private life he took advantage of his opportunities to keep in touch with scientists and educators in this country and abroad.

"Instead of evolving the University of Virginia entirely out of his own inner consciousness, Jefferson combined, in an original and independent creation, the results of academic training, philosophical culture, foreign travel, wide observation, and of an extensive correspondence with the most illustrious educators of his time. His intelligent study of Old World institutions prepared him to devise something new for Virginia and America." (496)

Jefferson was especially influenced by what he learned about science and education in France and Switzerland.

Among the things which had some influence in preparing the way for the University of Virginia was an attempt to establish in Richmond a kind of French academy of arts and sciences, with branches in Baltimore, Philadelphia and New York, to be affiliated with royal societies of London, Paris and Brussels, and other learned bodies in Europe.

The academy was to collect and send abroad natural products of North America and to bring from Paris experts, especially mineralogists and mining engineers, to teach American graduates of colleges and serve on scientific commissions. It was also to publish an "Almanac" and memoirs.

Such an institution was suggested in 1778 by John Page, Lieutenant-Governor of Virginia, to Chevalier Quesnay de Beaurepaire, who took the matter up enthusiastically and raised 60,000 francs as a beginning of financial support.

Franklin and Jefferson when in France, together with other distinguished men in America, France and Great Britain, became interested in this project.

On June 24, 1786 the corner-stone for a building for this academy was laid in Richmond and the building was completed in 1788. That year provisional arrangements were made for "schools" of advanced instruction including experimental physics, chemistry, mineralogy, botany, anatomy (human and veterinary) and natural history.

The coming on of the French Revolution prevented the consummation of this ambitious scheme. The building intended for the academy was used in 1788 by the Virginia Convention which ratified the Consitution of the United States.

32

In January, 1800, Jefferson wrote to Dr. Joseph Priestley ~~xxxxxxxxxx~~ outlining a plan for a university and asking his advice. Agriculture was included in the list of sciences to be taught in the university. That year Dupont de Nemours, the French economist and philosopher with whom Jefferson had become acquainted in Paris before the Revolution, visited him in Philadelphia, and at his request wrote a treatise "Sur L'Education Nationale dans les Etats-Unis". This contained an elaborate plan for a comprehensive system of education including schools of medicine, mines, social science and legislation, and higher mathematics, to be located at the capital of the United States. These schools were to be housed in a great building which would also contain a library, museum, rooms for a philosophical society, and offices for the minister of public education. A botanical garden was to be attached.

On February 5, 1803, Jefferson wrote to Professor Pictet, at the Swiss College at Geneva, asking about the branches of science taught there and the work of the professors.

In 1806 Joseph Carrington Cabell (1778-1856), a graduate of William and Mary, returned from several years' study of science and education in Europe, and went to see Jefferson. On his advice, Cabell went into the Virginia legislature and for twenty years advocated local government, popular education, and a state university. It was Cabell who made Jefferson's plan for a university effective.

From the above incidents in Jefferson's life it will be seen that his ideas regarding an institution for higher learning in Virginia were maturing for many years and were influenced by information and advice from many sources.

In a letter of December 31, 1783, Jefferson expressed interest in a proposition to start an academy (grammar school) in Albemarle County, near his home at Monticello. This academy was chartered in 1803, but nothing further was done until 1814 when Jefferson was made chairman of a committee to raise funds. Within ten days this committee made a report. Another committee to locate a site reported in favor of a place near Charlottesville, and outlined a plan for improvements. Albemarle Academy, however, never went into operation but Jefferson's work regarding it is an evidence of his early desire to have an educational institution near his home.

In 1810 Jefferson introduced to Cabell Dr. Thomas Cooper, a son-in-law of Priestley, who came with him to Pennsylvania and became a judge as well as professor in Dickinson College, and lecturer in the University of Pennsylvania. He was well versed in chemistry, physics and physiology, as well as in law and political economy. Jefferson corresponded with him in 1814 on his plans for a university, and later on endeavored to have him made a professor in the University of Virginia.

On Sept. 7, 1814, in an elaborate letter to Peter Carr, president of the board of trustees of Albemarle Academy, which was printed in the Richmond Inquirer for propaganda purposes, Jefferson gives his general educational plan and details regarding the studies to be pursued in college and professional schools. In this scheme is included a school of rural economy for "agricultors" and a "school of technical philosophy".

"To such a school", he said, "will come the mariner, carpenter, shipwright, pump-maker, clock-maker, mechanist, optician, metallurgist, founder, cutler, druggist, brewer, vintner, distiller, dyer, painter, bleacher, soap-maker, tanner, powder-maker, salt-maker, glass-maker, to learn as much as shall be necessary to pursue their art understandingly, of the sciences of geometry, mechanics, statics, hydrostatics, hydraulics, hydronamics, navigation, astronomy, geography, optics, pneumatics, acoustics, physics, chemistry, natural history, botany, mineralogy, and pharmacy." (496)

In this school there was also to be elementary and practical instruction by lectures to be given in the evening. Military instruction was also included in Jefferson's plan.

In 1810, Virginia established a "literary fund" by which the proceeds of certain "escheats, penalties, and forfeitures" were devoted to the encouragement of learning, and in 1816 a portion of the debt due Virginia from the federal government for expenses of the War of 1812 was added to this fund.

An act of February 14, 1816 changed the name of Albemarle Academy to Central College, made the governor a patron of this institution, and provided for the appointment of six visitors. Jefferson, Madison, Monroe, Cabell, David Watson, and J. H. Cocke were appointed members of this board.

The corner-stone of the building for this college was laid October 6, 1817.

On February 24, 1816 the President and directors of the Literary Fund were requested by the legislature to report a system of public education including an institution to be called "The University of Virginia". Governor Nicholas, as president of the commission, consulted Jefferson, Thomas Cooper, J. A. Smith, President of William and Mary College, Timothy Dwight, President of Yale College, James Monroe, and Samuel L. Mitchill of New York. The report largely favored Jefferson's plan. A bill was introduced in 1817 providing for a university and lower schools. When this bill failed of passage, Jefferson undertook to secure a measure which would make the establishment of a university certain. He prepared the way by submitting to the legislature a carefully prepared report on the progress of Central College. He also wrote to Cabell, and the letter was published in the Richmond Enquirer, explaining fully his plan for self-supporting elementary schools, and then had a bill introduced providing for a general system of public education.

The House of Delegates adopted a substitute bill which provided very inadequately for common schools. To this the Senate added "a \$15,000 annual appropriation for a university wherein all branches of useful science were to be taught", and a board of commissioners to locate the university and provide for its operation.

with by lecturers to be given in the evening.

included in the list.

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the federal government. For expenses of the trip of \$100 was added to this fund.

and also covered the name of the lecturer mentioned.

for the appointment of six visitors.

David Watson,

REPORT ON THE VISIT TO THE UNITED STATES OF AMERICA

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With the aid of Cabell this amended bill was passed Feb. 21, 1818.

Jefferson was made president of the board and prepared the report. This contained his ideas on primary and higher education, located the university at Central College, and gave a plan for buildings, professorships, courses of study, etc.

In spite of strong opposition Cabell and other friends of the University succeeded in securing the passage of Jefferson's bill based on this report, and on January 25, 1819, the University of Virginia and Central College were legally united.

The act conveyed the property of Central College to the State, represented by the president and directors of the Literary Fund, "which was really a Board of Public Instruction".

Seven visitors were to be appointed by the Governor to manage the University and to choose a rector. Jefferson, Madison, Cabell and Cocke were carried over from the old board, and Jefferson was chosen rector.

For seven years, until his death in 1826, he was "a directing and shaping power in the upbuilding of the University of Virginia".

Not only did he evolve the entire system of education there introduced, but he actually devised every feature of construction and administration.

The legislature was persuaded to pursue a liberal policy toward this institution. In 1823 the sum of \$50,000 for a library and apparatus and \$32,000 for buildings were granted from funds due the State from the Federal Government on account of war expenses, etc. The University was opened for students March 7, 1825. (p.232)

In the report of the commissioners to the legislature, Jefferson expressed his view of the relation of the State to higher education as follows:

"an establishment embracing all the sciences which may be useful and even necessary in the various vocations of life, with the buildings and apparatus belonging to each, are far beyond the reach of individual means, and must either derive existence from public patronage, or not exist at all. This would leave us, then, without those callings which depend on education, or send us to other countries to seek the instruction they require. * * * Nor must we omit to mention the incalculable advantage of training up able counsellors to administer the affairs of our country in all its departments, - legislative, executive, and judicial, and to bear their proper share in the councils of our National Government; nothing more than education advancing the prosperity, the power, and the happiness of a nation." (496)

And among the objects of higher education is the function

"to harmonize and promote the interests of agriculture, manufactures, and commerce, and by well-informed views of political economy to give a free scope to the public industry."

North Carolina

In North Carolina the constitution of 1776 provided in Section XLI, evidently copied from the Pennsylvania constitution,

"That a school or schools shall be established by the Legislature, for the convenient instruction of youth, with such salaries to the masters, paid by the public, as may enable them to instruct at low prices; and all useful learning shall be duly encouraged, and promoted, in one or more universities." (91)

No action was taken for the establishment of a general school system until 1816 when a commission was appointed to prepare a plan. This was comprehensively drawn but failed of action in the legislature and it was not until 1825 that the beginning of a state system was made. Meanwhile, in 1789 the University of North Carolina was chartered and began its first session in 1795 at Chapel Hill. "While established and controlled by the State, no direct appropriation was made either for buildings, equipment, or support during the first ninety years of its existence." It was, however, granted certain "old claims on sheriffs, and other public officers and escheats, including unclaimed land warrants, to be located in West Tennessee, granted to continental soldiers". For many years little financial benefit was derived from these sources. The State also loaned the University \$10,000 and afterwards made this a gift. (See also p. 401)

In South Carolina in 1785 three colleges were chartered by the legislature, but the only one which was permanently established was the College of Charleston. (481) This received from the State at different times small grants of land, escheats and money. Governor Drayton in 1801 recommended to the legislature the establishment of a college under State control. The legislature immediately passed a bill chartering the South Carolina College, with a board of trustees consisting of 13 persons, elected by the legislature, and several State officials, ex-officio. An appropriation of \$50,000 was made for a building and \$6,000 annually for current expenses. The college was opened at Columbia January 10, 1804 with a president and one professor. Its expenses have been regularly met by State appropriations and tuition fees. It was first renamed as the University of South Carolina in 1866, but this name was changed back to South Carolina College in 1877. Since 1887 it has again been called the University of South Carolina. (See p.182)

Georgia

In Georgia a school with some industrial features was established at Bethesda, near Savannah, in 1740. (166) This was known as The Orphan House, being an institution for indigent orphans. In 1737 Rev. Charles Wesley suggested such an institution to George Whitefield, who took it up actively, secured a grant of 500 acres from the trustees of the colony, and raised money in England and the colonies. A wooden building, 70 x 40 feet, was built in 1740. The next year the school had 63 boys and girls, many of whom in addition to their studies learned trades or domestic ^{arts} science.

In 1764 Whitefield attempted to convert this school into "a seminary of literature and academical learning" for the Southern colonies, including Florida and the British West Indies. He attempted to get a charter on the plan of the College of New Jersey, and failing in this sought to have an academy like that established at Philadelphia under Franklin's influence. Whitefield's death in 1770, together with two fires, a hurricane, and lack of funds brought the institution to an end within comparatively few years.

The first constitution of Georgia, adopted in 1777, provided in Section LIV that "schools shall be erected in each county, and supported at the general expense of the State". The act of July 31, 1783 gave the Governor authority to grant a thousand acres for a free school in each county, and for academies at Waynesboro in Burke County and Augusta in Richmond County.

At Augusta the County Commissioners were directed to lay out the reserve land into acre lots and sell them, the proceeds to be used among other things to establish an academy. This school was opened in 1785 and has continued ever since.

At least five other academies were incorporated before the end of the century and given grants of property confiscated during the Revolutionary War.

In the third constitution of Georgia, adopted in 1798, Article IV, Section 13 provides that "The arts and sciences shall be promoted, in

one or more seminaries of learning; and the legislature shall, as soon as conveniently may be, give such further donations and privileges to those already established as may be necessary to secure the objects of their institution; and it shall be the duty of the general assembly, at their next session, to provide effectual measures for the improvement and permanent security of the funds and endowments of such institutions." (91)

In 1792 the legislature authorized "the commissioners of the value county academies to purchase 1,000 pounds of confiscated property for the use and support of their respective institutions. Similar provisions were made in 1802 and 1810." (166)

By 1829 64 academies were in active operation in the State.

On July 8, 1783 Governor Lyman Hall, in his message to the Legislature, made the following statement:

"In addition, therefore, to wholesome laws restraining vice, every encouragement ought to be given to introduce religion and learned clergy to perform divine worship in honor of God, and to cultivate principles of religion and virtue among our citizens. For this purpose, it will be your wisdom to lay an early foundation for endowing seminaries of learning; nor can you, I conceive, lay a better than by a grant of a sufficient tract of land that may, as in other governments, hereafter, by lease or otherwise, raise a revenue sufficient to support such valuable institutions." (166)

The Legislature responded by passing the act of Feb. 25, 1784, under which 40,000 acres of land were conveyed to a board consisting of the Governor, and seven other persons, in trust for the endowment of a college or seminary. "Abraham Baldwin, a graduate of Yale and one of the best scholars of his time" was a member of this Legislature, originated the plan of the University of Georgia and obtained the grant of land.

The act of January 27, 1785 granted a charter to a board of thirteen trustees to establish the "university of Georgia". Provision was also made for a Board of Visitors, including the Governor, Council, Speaker of the House and Chief Justice. These two bodies were to constitute the "Senatus Academicus of the University of Georgia".

Section 14 of this act provided that

"all public schools instituted or to be supported by funds or public moneys in this State, shall be considered as parts or members of the University."

In 1787, 5,000 acres of the land previously granted to the University were given to South Carolina and there was some further curtailment by overlapping of grants.

The "Senatus Academicus" had its first meeting in November, 1799.

In 1801 Governor Milledge gave about 630 acres at a place now called Athens, and the first college of the university began to operate as Franklin College.

Josiah Meigs, LL.D., who had been professor of natural philosophy and astronomy at Yale College, was elected President in 1800 at a salary of \$1,500. He served ten years, during which time he had only one assistant. The first classes were held under a large oak, and fifty men were graduated with the degree of A. B. during the first ten years.

At first the college was supported by rental of land and then for a time by the proceeds of sales, but before long the remaining lands were sold and the proceeds invested in mortgages.

By an act of December 16, 1815, the State agreed to take the notes and advance \$100,000, but this was not done, and finally in 1821 an agreement was reached that 8% should be paid annually on this amount. ~~and this has continued ever since.~~

For buildings and equipment loans were made by the State of \$5,000 in 1802, and \$10,000 in 1816 and in 1830. From 1830 to 1841 annual appropriations of \$6,000 were made, but thereafter the State made no further appropriations to the University until 1875. (See also p. 266)

Alabama

In Alabama the first State constitution, adopted in 1819, provided that

"Schools, and the means of education, shall forever be encouraged in this State; and the general assembly shall take measures to preserve, from unnecessary waste or damage, such lands as are or hereafter may be granted by the United States for the use of schools within each township in this State, and apply the funds, which may be raised from such lands, in strict conformity to the object of such grant. The general assembly shall take like measures for the improvement of such lands as have been or may be hereafter granted by the United States to this State, for the support of a seminary of learning, and the moneys which may be raised from such lands, by rent, lease, or sale, or from any other quarter, for the purpose aforesaid, shall be and remain a fund for the exclusive support of a State university, for the promotion of the arts, literature and the sciences; and it shall be the duty of the general assembly, as early as may be, to provide effectual means for the improve- (122)
ment and permanent security of the funds and endowments of such institution."

Before this time Congress had given 72 sections of land for the "endowment of a seminary of learning".

At the first legislature in 1819 Governor Bibb called attention to the provision of the Constitution relating to the seminary and was authorized to appoint commissioners to lease the lands granted to it. In 1820 an act was passed establishing "The University of Alabama" and the following year this institution was incorporated, with the Governor, ex-officio, and twelve other persons to be elected by the legislature, constituting a board of trustees for a term of three years. They were given authority to sell or otherwise dispose of the land for the benefit of the University. By 1838 a permanent fund of about \$300,000 had accumulated and on this amount the State agreed to pay interest at 6%. Tuscaloosa was approved by the legislature as the site of the University in 1827. It was opened for students in 1831.

Mississippi

In Mississippi, Jefferson College was incorporated by the Territorial legislature in 1802, but was not opened until 1811 and thereafter continued for many years as an academy. (293) In 1803 it received a grant of land from Congress, and grants of escheats and money from the legislature. In 1826 the State was given authority to fill vacancies in the Board of Trustees and this was done for a number of years. For a long time the governor was ex-officio president of the board.

By acts of 1815 and 1819 Congress granted lands to the Mississippi Territory to be held in trust by the legislature for the support of a seminary of learning. Out of this came a seminary fund. After long agitation an act for the location of the University of Mississippi was passed and Oxford was selected as its site.

A charter was granted in 1844 and the University was opened November 6, 1848. (See also p.471)

When it appeared that income from the seminary fund was not available, the legislature made direct appropriations to this institution, beginning in 1846. Liability for the seminary fund on the part of the State was not recognized until 1880 when it appeared that the fund should amount to at least \$544,061. Interest on this amount at 6% was then ordered to be paid quarterly.

Louisiana

In Louisiana the Legislative Council of the Territory of Orleans in 1805 passed an act which provided for an institution to be called "The University of Orleans", under a board of regents, including the governor and other officials and seventeen citizens. (200)

The regents were authorized to establish "The College of New Orleans", academies for boys and girls in the counties, and a public library in each county. These institutions were to be supported by lotteries. Dissatisfaction with this provision led to its abandonment and in 1811 an appropriation of \$39,000 was made - \$15,000 for the college, and \$2,000 each for schools in the counties. Beginning in 1819 annual appropriations of several thousand dollars were made. The College of New Orleans went into operation for a time, but the population was not sufficient to make a high-grade institution possible. In 1821 the university scheme was given up, and in 1826 the college was closed.

In 1825 the College of Louisiana at Jackson was chartered and given an annual appropriation of \$5,000 taken from the College of New Orleans. This college was more successful and continued in existence eighteen years.

Jefferson and Franklin Colleges and a number of academies were subsidized by the State, but in 1845 all appropriations for education were withdrawn. The amended constitution of that year provided that "a university shall be established in the city of New Orleans" and this was chartered in 1847 as the University of Louisiana. This institution received quite limited appropriations from the State until 1884, when it was united with Tulane University and State support was withdrawn. In 1853

an act providing for "The Seminary of Learning of the State of Louisiana" was passed, and this institution received the benefit of grants of land made by Congress in 1806 and 1811. Out of this institution finally grew the present State University at Baton Rouge. ~~XXXXXXXXXX~~

Ohio

Ohio University (which must not be confused with Ohio State University at Columbus) owes its origin and endowment to the Ohio Company of Associates who in 1787 purchased a large tract of land from the National Government intending to colonize it with people from New England. (446)

That year Dr. Manasseh Cutler, as representative of the Ohio Company, was instrumental in securing the passage by Congress of ordinances for the government of the Northwest Territory, and for the sale of the lands desired by the company. He also obtained a grant of two townships for the support "of a literary institution to be applied to the intended object by the legislature of the State". In 1795 the lands to be devoted to this purpose were located in Athens County, Ohio, and in 1800 by direction of the legislature a site for a college was laid off. Dr. Cutler drafted a charter for an institution which he proposed to call the American University.

"In 1802 the legislature of the Northwest Territory passed an act establishing a university and giving to it in trust the land grant."

"The first trustees were named in the charter and were to serve for life, but their successors were to be chosen by the legislature of the territory or (442) State." ^ The institution was chartered as the American Western University and located in the town of Athens.

Apparently nothing was done under this act, but in 1804 the State legislature incorporated the institution as Ohio University. The provision regarding the appointment of trustees by the legislature, contained in the first charter, was retained, and the governor, was made an "ex-officio member". The institution was opened for students in 1808. The two townships of land were given for the endowment of the university, but subsequent legislation prevented the university from getting full benefit from this grant so that the university receives only about \$7,500 annually from this source. Until 1881 the State made no appropriations for the support or equipment of the college. This was the first college endowed with funds from national land-grants.

In 1803 Congress passed an act in which was a provision reserving a township in the Cincinnati District for a university. This resulted in 1809 in the creation of Miami University, which was finally located at Oxford. It was opened as a grammar school in a log house in 1816 and did not become a college until 1824.

Kentucky

In Kentucky, Transylvania University, the first college established west of the Alleghany Mountains, grew out of an act of the Virginia legislature in 1780, granting 8,000 acres of land "as a free donation from this commonwealth for the purpose of a publick school, or a seminary of learning". Transylvania Seminary was established near Danville, Kentucky, in 1785 but was removed to Lexington, where in 1798 it was rechartered as Transylvania University.

Tennessee

In Tennessee, the University of Tennessee grew out of Blount College, (488) chartered in 1794 by the "Territory south of the Ohio River". Tennessee became a state in 1796. In 1807 this college was combined with East Tennessee College which had just been chartered. This combination was made to give the institution one-half of the proceeds from the land granted by Congress in 1806 for colleges in Eastern and Middle Tennessee. So little money was realized from this land that the college was not opened until 1820. In 1826 the present site at Knoxville was purchased. In 1840 this institution became East Tennessee University and in 1879 the University of Tennessee, which receives the benefits of the Federal land-grant act of 1862 and supplementary legislation and is now wholly under control of the State. (~~See Appendix~~)

Summary of Methods of State Aid to Education

In his History of Federal and State aid to Higher Education, Dr. Blackmar thus summarizes the methods of State aid:

"The principal ways in which the several States have aided higher education may be enumerated as follows: (1) by granting charters with privileges; (2) by freeing officers and students of colleges and universities from military duty; (3) by exempting the persons and property of the officers and students from taxation; (4) by granting land endowments; (5) by granting permanent money and endowments by statute law; (6) by making special appropriations from funds raised by taxation; (7) by granting the benefits of lotteries, and (8) by special gifts of buildings and sites. Nearly all of these methods originated among the colonies and were adopted by the States."

* * *

"An historical retrospect of the relation of the State to education may be presented in a few propositions, as follows: (1) in colonial times State, private, and church benevolence worked together; (2) subsequently private and church schools were prominent, still being aided by State appropriations; (3) the gradual cessation of State aid to private and church schools, and the growth of State universities." (15)

Beginning of Federal Aid to Education

The disposition of the vast areas of land west of the Alleghany Mountains was a problem which engaged the attention of Washington and other statesmen even before the close of the Revolutionary War. Settlers in this region felt keenly the need of a definite political organization through which they could function. "Sentiment in favor of nationalizing all western land was becoming general." In 1779 Maryland declared in favor of this policy. On October 10, 1780, Congress passed a resolution that the western territory ceded by the States should be disposed of for the common benefit of all the States and that the manner and condition of the sale of these lands should be exclusively regulated by Congress. In 1780, New York offered to cede her western lands and the following year Virginia made a similar offer.

"While the proposition of Virginia to cede all of her lands north of the Ohio River, on certain conditions, to the United States was before Congress, a measure was on foot in New England to form a State in the territory between Lake Erie and the Ohio River, to be settled by 'army veterans and their families.' Col. Timothy Pickering drew up a plan of government of the prospective State, and Rufus Putnam prepared a petition signed by soldiers and forwarded the same to Congress through General Washington. This petition is important, because it contains the first mention of a national reserve of lands for the support of education." (15)

This plan, known as the "Army plan", was made in 1783 and provided that

"all surplus lands shall be the common property of the State and disposed of for the common good; as for laying out roads, building bridges, erecting public buildings, establishing schools and academies, defraying the expenses of government, and other public uses."

Washington urged Congress to settle accounts with the army before its dispersion.

Hamilton was also greatly interested in this matter and on June 5, 1783, an ordinance was introduced in Congress, containing the so-called "Financiers' Plan." This included a provision that 10,000 acres out of every 100,000 granted for the payment of the army debt should be reserved for the use of the United States and that the revenues from these reserved lands should be used among other things for "the founding of seminaries of learning". It is interesting to note that the army plan "put the support of education from public lands under State control, the other placed the control with the national government". Congress took no action on either plan. In 1784, however, the Virginia cession was accepted and in 1785 an ordinance was adopted which contained a clause reserving from sale "lot number sixteen of every township for the maintenance of public schools within the said township".

The importance of this educational provision does not seem to have been recognized at the time of its passage, when chief attention was centered on this measure as a plan for the sale of public land, but it established a precedent of far-reaching influence in later years and marks the beginning of a policy of using public lands for public education.

Then followed the appeal to Congress by Dr. Manasseh Cutler, representing the Ohio colonization company. This resulted in the "ordinance of July 13, 1787, for the government of the North-West Territory", which contained the declaration that "religion, morality, and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged."

Without doubt the great significance of the educational provision in the Ordinance of July 13, 1787, was not appreciated by Congress or the public. The Constitutional convention was in session in Philadelphia at that time and the proceedings of the old Confederation Congress in New York received scant attention in the press. This ordinance made no grants of land for education but laid the foundation for a general development of free public education throughout the United States.

It was immediately followed by the Ordinance of July 23, 1787, for the sale of public lands in Ohio, under which section sixteen in each township was to be reserved for the maintenance of public schools and "not more than two complete townships to be given perpetually for the purpose of a University". Under this ordinance lands were sold to the Ohio Company and this led to the foundation of Ohio University, as the first college endowed with national land grants. (63)

"In October, 1787, Congress resolved to give no more lands for seminaries or academies in connection with private contracts unless the purchases were as large as that of the Ohio Company and in some States other than Ohio." But on April 12, 1792, in making a final settlement with John Cleve Symmes for lands purchased by him between the Great and Little Miami Rivers, Congress gave him a township for an academy, thus renewing "the policy of making special land grants for higher and secondary education."

Congress granted lands for schools to Ohio when it became a State in 1802 and for a university in 1803. As a result of the latter grant, Miami University (64) was created in 1809. Similar grants of land for educational purposes were made by Congress from time to time to the territories and States formed in the Northwest Territory and beginning with 1803 in Tennessee to the new States in the South and West.

About 1820 was begun the practice of granting to each State on admission two townships of saline lands and from three to five per cent of the net proceeds of the sale of all public lands within its borders. These grants of land and money were in many cases used at least in part for education. In the Internal Improvement Act of 1841, 500,000 acres of public lands were given to each State admitted after 1800 and these grants were devoted to education after 1845. In 1850 the swamp land-grant act was passed under which 15 States received over 60,000,000 acres. In 12 States a part or all of the proceeds from the sale of these lands was given to education.

Washington's Proposal for a National University

In the Constitutional Convention of 1787 over which Washington presided, Charles Pinckney of South Carolina offered a plan for a Federal Constitution which contained a clause authorizing Congress "to establish and provide for a national university at the seat of government of the United States", and in the discussion of the Randolph constitution Pinckney and Madison moved to give Congress power "to establish an university" but this was not adopted.

That year Dr. Benjamin Rush of Philadelphia in "An Address to the people of the United States" proposed the establishment of a National University.

"To conform the principles, morals and manners of our citizens, to our republican forms of government, it is absolutely necessary that knowledge of every kind should be disseminated through every part of the United States.

For this purpose, let Congress, instead of laying out half a million of dollars in building a federal town, appropriate only a fourth of that sum in founding a federal university. In this university let every thing connected with government, such as history - the law of nature and nations - the civil law - the municipal laws of our country - and the principles of commerce - be taught by competent professors. Let masters be employed likewise to teach gunnery, fortification, and every thing connected with defensive and offensive war. Above all, let a professor of, what is called in the European universities, economy, be established in this federal seminary. His business should be to unfold the principles and practice of agriculture and manufactures of all kind, and to enable him to make his lectures more extensively useful. Congress should support a travelling correspondent for him, who should visit all the nations of Europe, and transmit to him, from time to time, all the discoveries and improvements that are made in agriculture and manufactures. To this seminary young men should be encouraged to repair, after completing their academical studies in the colleges of their respective States."

This was followed up by an anonymous article printed in the Pennsylvania Gazette and the Massachusetts Centinel in 1788, in which a "plan for a Federal University" was given in more detail. This was probably written by Dr. Rush, though it has also been attributed to Madison who was in full accord with the proposition. Among the subjects of instruction in this university were to be "agriculture in all the numerous and extensive branches", "those parts of natural philosophy and chemistry, which admit of an application to agriculture, manufacture, commerce, and war" and "natural history, which includes the history of animals, vegetables and fossils. To render instruction in these branches of science easy, it will be necessary to establish a museum, and also a garden, in which not only all the shrubs, etc., but all the forest trees of the United States should be cultivated." To aid the professors four young men of good education should be sent to Europe to collect and transmit "all the improvements that are daily made" in agriculture, manufactures, commerce, etc., and two young men should be employed to explore "the vegetable, mineral and animal productions of our country" and to obtain histories and samples of them for the university.

In his first message to Congress in 1790 Washington said:

"Nor am I less persuaded that you will agree with me in opinion that there is nothing more deserving your patronage than the promotion of science and literature. Knowledge in every country is the surest basis of public happiness. In one in which the measures of government receive their impressions so immediately from the sense of the community as ours it is proportionally essential."

After reviewing the benefits to be derived from the spread of intelligence he continues:

"Whether this desirable object will be best promoted by affording aid to seminaries of learning already established, by the institution of a national university, or by any other expedients, will be well worthy of a place in the deliberation of the legislature."

The previous year he had been in correspondence with Baron Pöllnitz,

(75)

who had a farm for experimental purposes near New York City. When Pöllnitz heard of Washington's proposal to Congress he suggested to the President the "establishing of an experimental farm under the government's patronage."

Washington replied, "I know not whether I can with propriety do anything more at present than what I have already done." His message of 1796 shows that he had at last made up his mind to make more definite recommendations regarding measures for the promotion of education and agriculture. One of these recommendations was for the establishment of a National University. His reasons for this were as follows:

The assembly to which I address myself is too enlightened not to be fully sensible how much a flourishing state of the arts and sciences contributes to national prosperity and reputation. True it is that our country contains many seminaries of learning highly respectable and useful; but the funds upon which they rest are too narrow to command the ablest professors in the different departments of liberal knowledge for the institution contemplated, though they would be excellent auxiliaries. Among the motives to such an institution the assimilation of principles, opinions, and manners of our countrymen by the common education of a portion of our youth from every quarter well deserves attention; the more homogenous our citizens can be made in these particulars, the greater will be our prospects of permanent union; and a primary object of such a national institution should be the education of our youth in the science of government.

This led to a memorial dated November 21, 1796, by the commissioners appointed under the act "establishing the temporary and permanent seat of the Government of the United States." This memorial stated that the deeds of the land for the Federal city authorized the President of the United States "to appropriate such portions thereof as he should judge necessary to public use."

In virtue of this power the President has appropriated 19 acres, one rood, and 21 perches, part of the land so ceded, for the site of a national university. * * * He has likewise declared to them his intention to grant, in perpetuity, fifty shares in the navigation of the Potomac River.

The Commissioners strongly urged some action by Congress with reference to this matter, and especially the passage of a law which would permit donations for the benefit of such an institution in order that a fund might be accumulated for its support.

On December 21, 1796, Mr. Madison, from the committee to whom was referred this memorial, and that part of the President's speech relating to a national university, presented the following resolution:

"That it is expedient, at present, that authority should be given as prayed for by the said memorial, to proper persons to receive and hold in trust pecuniary donations, in aid of the appropriations already made, towards the establishment of a university within the District of Columbia."

Congress took no further action at this time.

The project for a national university was revived in 1806 when Jefferson was President with Madison in his cabinet and Dr. Samuel Latham Mitchill, "one of his strongest supporters in Congress." This was brought about by Joel Barlow, a graduate of Yale in 1778, who had considered this matter during a long residence in Paris. On his return to the United States in 1805 he prepared a prospectus of a National Institution, which was first published January 24, 1806, in an anonymous pamphlet and later in that year in the National Intelligencer at Washington. (160) This institution, supported by public and private funds, was to have for its objects "the advancement of knowledge by associations of scientific men, and the dissemination of its rudiments by the instruction of youth." It might well be the "depository of the results of scientific research; of experiments in arts, manufactures and husbandry; and of discoveries by voyages and travels." "No rudiment of knowledge should be below its attention."

The chancellor and trustees of the institution "shall establish a central university, at or near the seat of government, and such other universities, colleges and schools of education, as the funds of the institution will enable them to do, whether in the City of Washington or in other parts of the United States." Included in the equipment of the institution were to be "gardens for botany and agricultural experiments."

Barlow's prospectus was widely circulated and attracted so much favorable attention that he drafted a bill for the incorporation of the institution. This was introduced in the Senate by Mr. Logan of Philadelphia but was buried in the committee to which it was referred.

EARLY AGRICULTURAL SOCIETIES IN AMERICA

American Philosophical Society at Philadelphia

With the growth of interest in science and its possible application in agriculture and other industries there was a natural tendency toward the formation of groups of people to maintain and enlarge this interest.

Reference has already been made to Franklin's successful effort to found a Philosophical Society and this may have been an outcome of his club called the Junto. (35) ^

The first public suggestion for such a society was made by Franklin May 14, 1743, in a paper entitled "A proposal for promoting useful knowledge among the British Plantations in America". This suggests that an organization to be known as The American Philosophical Society be formed with headquarters in Philadelphia to collect and disseminate, through "letters, communications, or queries", information regarding observations and experiments on a great variety of scientific and practical subjects. Among the subjects listed by Franklin are the following: All new-discovered plants, herbs, trees, roots, their virtues, uses, etc.; methods of propagating them and making such as are useful, but particular to some plantations, more general; new discoveries in chemistry; nature of the soil and productions of different regions; new methods of improving the breeds of useful animals; introducing other sorts from foreign countries; new improvements in planting, gardening, and clearing land. Provision should be made for an annual printed report "of such experiments, discoveries, and improvements as may be thought of public advantage."

This Society was formed early in 1744 with Franklin as secretary. For several years regular meetings were held but these were discontinued, perhaps because Franklin went to England in 1757, and on April 25, 1766, a new society was formed under the title of "American Society for Promoting Useful Knowledge". In November 1767 the American Philosophical Society resumed activity and then the two societies were united on January 2, 1789, with Franklin as president. On his death in 1790 David Rittenhouse became president and he was succeeded by Thomas Jefferson. Publication of Transactions began in 1771, when a copy was given to each member of the Pennsylvania legislature with the statement that "the volume is wholly American in composition, printing and paper." The Society was incorporated in 1780 as the "American Philosophical Society, held at Philadelphia, for Promoting Useful Knowledge." A hall for the Society was erected in 1785, at 104 South Fifth Street, overlooking Independence Square.

While in its earlier years this society published many articles on agricultural subjects it developed chiefly as a scientific organization with only a general interest in matters relating to agriculture. There was therefore room in Philadelphia for an organization more definitely devoted to agriculture. When this was formed it often had its meetings in the hall of the Philosophical Society.

A few societies of temporary character dealing with agricultural matters antedated the formation of the Philadelphia Society. Among these were the New York Society for Promoting Arts, established in 1766 and the New Jersey Society for Promoting Agriculture, Commerce and the Arts, established about 1781. (See The Development of Agriculture in New Jersey, 1640-1880 by C. R. Woodward, New Jersey Agricultural Experiment Station Bulletin 451, May, 1927.) (315)

The Philadelphia Society for Promoting Agriculture

The organization of The Philadelphia Society for Promoting Agriculture was primarily due to the initiative of John Beale Bordley (1727-1804), a progressive planter in Maryland, who was author of its first constitution and vice-president until his death. (See Biographical Sketches of the Bordley Family of Maryland, by Elizabeth B. Gibson, Philadelphia, 1865.) The account of its origin, as given in its minutes, reads as follows:

"City of Philadelphia, February 11, 1785. In a conversation on the subject of agriculture and the promoting of improvements therein, within the States of America, it was proposed to form a Society for that purpose, to be held in the City of Philadelphia, and thereupon * * * [gentlemen] in number twenty-three were agreed and nominated to be the members thereof." (468)

Among these were Robert Morris, Benjamin Rush, George Clymer and John B. Bordley. Eight of these members met March 1, 1785, at Patrick Byrne's Tavern, Sign of the Cock, and appointed Messrs. Clymer and Bordley "to sketch out a Form of Laws". These were presented at a meeting held March 8, and "were considered, amended and enacted" March 15.

Among the provisions in those "Laws" were the following:

"The Society's attentions shall be confined to agriculture and Rural Affairs; especially for promoting a greater increase of the products of land within the American States."

"The Society will print 'memoirs' and observations on subjects communicated to them."

"The Society shall annually propose Prizes, upon interesting subjects, relative to actual experiments and improvements - and for the best pieces written on proposed subjects."

"The Society shall promote the establishment of other societies, or offices of correspondence, in the principal places in the country." (468)

Provision was made for "residing" and honorary members. The former were to include all members living within 10 miles of Philadelphia; the latter, "all members of agricultural societies in other States, with whom we shall correspond" and other persons elected by the Society. All honorary members were invited to assist in the meetings of the Society whenever they came to Philadelphia. The first president of the society was Samuel Powel (1739-1793), a graduate and trustee of the College of Philadelphia, who was twice mayor of that city and a judge in its courts. In 1792 he was speaker of the Pennsylvania Senate. He had a large estate in West Philadelphia. The second president, elected in 1805, was Richard Peters, (1744-1828), one of its founders, judge of the district court of Pennsylvania and member of the Continental Congress. He was also a graduate of the Philadelphia College and one of its trustees. His estate of 200 acres is now in Fairmount Park, Philadelphia, and was the site of the Centennial Exposition of 1876. The memoirs of the society contain more than 100 papers contributed by him.

To promote the society and increase its membership there was issued in 1785 "An Address from the Philadelphia Society for Promoting Agriculture with a summary of its Laws; and premiums offered". In this pamphlet the reason for establishing the Society is given as follows:

"The very imperfect state of American husbandry in general, compared with that of some countries in Europe, is too well known to be controverted.

It was a conviction of our great inferiority, in this respect, which gave rise to the present Society, formed after the example of institutions in Europe, whose laudable endeavors to promote the agriculture of their several countries, have been rewarded with the happiest effects." * * *

"And here it may be observed that the difficulties these societies had originally to overcome were much greater than we shall have to contend with; they found Husbandry, generally, in a rude and unprofitable state, and had to recommend improvements from single instances of more skillful and fortunate management, until the whole, from the force of imitation, gradually became more perfect. But we, instead of solitary examples of extraordinary and successful conduct amongst ourselves, may have the established practice of entire nations to hold up, as an encouragement, which we purpose to lay before the public from time to time."

"Among the premiums offered by this Society was the following:

For the best experiment made of a course of crops, either large or small, or not less than four acres, agreeable to the principles of the English mode of farming, mentioned in the foregoing Address - a piece of plate of the value of two hundred dollars, inscribed with the name and the occasion."

There was also a second prize of \$100, and gold and silver medals were offered for 12 other subjects. In reporting experiments, "it is recommended that reasoning be not mixed with the facts."

It is evident that this society intended to serve as a national society. In its first publication it stated its purpose to "promote the establishment of other agricultural societies in the principal places in the country."

A list of members published in 1789 shows honorary members from Connecticut, Delaware, Kentucky, Maryland, Massachusetts, New Hampshire, New Jersey, New York, and Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, as well as from Jamaica, Italy, France and Great Britain. (Arthur Young) Among these were Governor George Clinton and Robert R. Livingston of New York, Noah Webster, Jr. of Connecticut, and George Washington, of Virginia. (Elected July 4, 1785). The resident members included Benjamin Franklin and Timothy Pickering.

Among the interesting matters noted in the early minutes are the following:

Dec. 5, 1785 a letter received from the South Carolina Society of Agriculture requesting correspondence was favorably replied to.

Feb. 14, 1786 a paper by Mr. Humphry was read, which contained "observations on the propriety and utility of applying botanical knowledge to the advancement of rural economics; particularly in ascertaining by experiments the various plants which may be used for feeding cattle."

The minutes of March 7, April 4, and Sept. 5, 1786 contain references to experiments in sowing wheat in clusters.

On Oct. 3, 1786 the Society was informed of the establishment in Connecticut of a Society for Promoting of Arts, Manufactures and Agriculture, and requesting correspondence.

June 5, 1787 there was correspondence on the Hessian fly with the Agricultural Society in New York.

July 3, 1787 Washington presented to the Society six volumes of the Annals of Agriculture by Arthur Young, which had been sent to him by the author for this purpose.

August 17, 1790 a paper entitled "The Farmer's Catechism" was received from Noah Webster, Jr., from Hartford, Conn.

Nov. 13, 1792 a proposal was received from the Secretary of the Agricultural Society in Burlington County, N. J., for printing the "Farmer's Magazine". It does not appear that this magazine was ever published.

In these minutes there is no record of meetings from March 12, 1793 until April 9, 1805, when John Vaughan presented a copy of "Rural Socrates", printed at Hallowell, Maine, in 1800; also two publications of Thomas Moore of Maryland - "The Great Error in American Agriculture Exposed and Means for Improvements Suggested", Baltimore, 1802 -- and "An Essay on Ice Houses" and "A Newly Invented Refrigerator to be used by Farmers Attending Markets"; also "A Treatise on Practical Farming" by John A. Binns, Fredericktown, Maryland, 1803.

In the Memoirs of the Society, published first in 1808, there is an account of a meeting January 21, 1794, when a committee was appointed to prepare a plan for a State society for the promotion of agriculture, which should include the promotion of agricultural education.

"Agreed, That Mr. Bordley, Mr. G. Clymer, Mr. Peters and Mr. Pickering be a committee to prepare outlines of a plan for establishing a state society for the promotion of agriculture; connecting with it the education of youth in the knowledge of that most important art, while they are acquiring other useful knowledge suitable for the agricultural citizens of the state.

And a petition to the legislature, with a view to obtain an act of incorporation." (467)

This committee made a report January 28, 1794, which was adopted, and the committee was instructed to present it to the legislature, and this was done but without success.

Important features of this plan were as follows:

- 1 - The legislature to be applied to for an act of incorporation of the society, which is to consist of citizens of the state, as generally dispersed throughout the same as possible.
- 2 - The governor of the state, the speakers of the houses of the legislature, and the chief justice for the time being, to be the visitors of the corporation.

"The transactions * * * and all by-laws and regulations, to be submitted to the visitors."

"Reports may by them be made annually to the legislature. These will be useful, as they will exhibit in a comprehensive view, the state of agriculture throughout the commonwealth, and give an opportunity to the legislature of being informed on a subject so important to the prosperity of the country, both as it relates to political economy and the individual happiness of the people. The legislature will perceive, from their reports, when and in what manner they may lend their assistance to forward this primary object. Whether by endowing professorships, to be annexed to the university of Pennsylvania and the college of Carlisle, and other seminaries of learning, for the purpose of teaching the chymical, philosophical and elementary parts of the theory of agriculture; or by adding to the funds of the society, increase their ability to propagate a knowledge of the subject, and stimulate, by premiums and other incentives, the exertions of the agricultural citizens; or whether by a combination of these means, the welfare of the state may be more effectually promoted.

- 4 - This recommends that county societies be established. "In union with, or as parts thereof, there may be agricultural meetings or establishments, at the will of those who compose them, in one or more townships of a county."

"The county schoolmasters may be secretaries of the county societies; and the school houses the places of meeting and the repositories of their transactions, models, &c. The legislature may enjoin on these schoolmasters, the combination of the subject of agriculture with the other parts of education. This may be easily effected, by introducing, as school books, those on this subject; and thereby making it familiar to their pupils. These will be gaining a knowledge of the business they are destined to follow, while they are taught the elementary parts of their education. Books thus profitable to them in the common affairs of life, may be substituted for some of those now used; and they can easily be obtained. Selections from the best writers on husbandry may be made by the society. The essays of our own experimentalists or theorists, and the proceedings of the society, will also afford information; and as many of these will, no doubt, be good models of composition, they may form a part of the selection for the use of the county schools. And thus the youth in our country will effectually, and at a cheap rate, be grounded in the knowledge of this important subject. They will be easily inspired with a thirst for inquiry and experiment, and either never acquire, or soon banish attachments to bad systems, originating in the ignorance and bigotry of their forefathers, which in all countries have been the bane of good husbandry. It will also be the business of the society to recommend the collection of useful books on agriculture and rural affairs in every county. The citizens of the country should be drawn into a spirit of inquiry by the establishment of small, but well chosen libraries, on various subjects. This would not only promote the interests of agriculture, but it would diffuse knowledge among the people and assist good government, which is never in danger while a free people are well informed."

6 - "It will be necessary that a contribution be made by each member, annually, for a fund. But this should be small, that it may not be too heavy a tax. The funds will no doubt, be increased by donations from individuals; and if the state should find the institution as useful as it is contemplated to be, the patriotism of the members of the government will be exercised, by affording assistance out of the monies of the state. They will perceive that it is vain to give facility to transportation, unless the products of the country are increased by good husbandry; And though these facilities are important to the objects of this society, yet an increased knowledge of agriculture is the foundation of their extensive utility. The subjects of both are intimately connected, and mutually depend on each other."

7 - "When the funds of the society increase sufficiently to embrace the object, it will perfect all its efforts by establishing Pattern Farms, in different and convenient parts of the state. Let the beginning of this plan be with one establishment, under the direction of the society, and committed to the care of a complete farmer and gardener. In this, all foreign and domestic trees, shrubs, plants, seeds or grains may be cultivated, and if approved as useful, disseminated, with directions for their culture, through the state. The most approved implements may be used on this farm, and either improved by additions, or simplified to advantage. Inventions may be brought to trial, and the best selected. Models thereof may be made and transmitted to the county and other societies. Those who are sent to, or occasionally visit the farm, will gain more knowledge in all its operations, from a short inspection, than can be acquired, in a long time, by

reading on the use and construction of instruments, or the modes of cultivation. The cheapest, best, and most commodious style of rural architecture - the most proper and permanent line-fences - improvements in the breed of horses, cattle, and sheep - remedies for occasional and unforeseen visitations of vermin - the times and seasons for sowing particular crops - the adapting foreign products to our climate - and preventives against all the evils attendant on our local situation, or arising from accidental causes - may here be practically introduced. The thoughts and suggestions of ingenious men may here be put in practice; and being brought to the test of experiment, their utility may be proved, or their fallacy detected. This farm need not be large. On it the best systems now known may be carried through, and farther experiments made; promising youths may be sent from different parts of the state, to learn practically the arts of husbandry. Manures and the best mode of collecting them, may be tried; native manures should be sought after, and premiums given for their discovery. Their efficacy may be proved by small experiments on this farm which should, in epitome, embrace the whole circle of practical husbandry. Similar farms may be added, as the funds increase; and thus practical agricultural schools be instituted throughout the state."

- 8 - "When the pecuniary affairs of the society become adequate, it will highly contribute to the interest of agriculture, if, at the expense of the society, some ingenious person or persons were sent to Europe, for the purpose of agricultural inquiries. It would be well too, if a few young persons, of promising abilities, were sent thither, to be instructed in the arts of husbandry, the breeding of cattle, &c. and to gain a practical knowledge on all subjects connected with this interesting, delightful and important business, on which the existence, wealth and permanent prosperity of our country so materially depend." (467)

A note is added to this Plan, beginning with the statement -

"It is much to be regretted, that the excellent plan proposed by the foregoing outline, was not acted upon and carried into effect by the legislature to which it was presented."

The United States Government had its seat in Philadelphia from 1790 to 1800. This undoubtedly brought Washington and other honorary members of the Society in closer touch with its affairs.

In 1796 when Washington made a proposal to Congress for the establishment of a National Board of Agriculture, he wrote to Richard Peters, an influential member of the Society, and for some time president, enclosing in his letter certain papers which he thought might be useful if members of the Society approached Congress on this subject.

From 1805 to 1810 the meetings of the Society were held in the hall of the Philosophical Society.

November 2, 1807, Dr. Benj. Rush lectured before the Society on the diseases of animals and advocated the teaching of veterinary science at the University of Pennsylvania.

February 14, 1809, the Act incorporating the Society was passed by the Pennsylvania legislature.

January 9, 1816, in a Discourse on Agriculture, by Richard Peters, there is reference to his unsuccessful efforts to secure adoption by the legislature of the plan for a State Agricultural Society. He urged the Society to continue its efforts for agricultural education. ^

In 1823 the Pennsylvania Agricultural Society including Philadelphia, Chester, Montgomery and Delaware counties was founded and held several fairs during its existence.

The character of the literature on agriculture available to the Philadelphia Society in its early years is indicated by the following list of its Library, about 1807:

LIBRARY

Martyn's edition of Miller's Gardener's Dictionary, 2 vols. folio.
 Dr. Mease's edition of Willich's Domestic Encyclopaedia, 5 vols.
 Bordley's Notes on Husbandry.
 Trans. Agric. Soc. New York, 3 vols.
 Marshall's Rural Economy, 14 vols. viz.
 Southern Counties.
 Do. New Edition.
 Yorkshire.
 West of England.
 Norfolk..
 Gloucestershire.
 Midland Counties.
 M'Mahon's Gardener.
 Darwin's Phytologia.
 Peters on Gypsum.
 Culley on Live Stock.
 Lawrance's Farmer's Calender.
 do. on Cattle.
 Communications to the Board of Agriculture of London, 4 vols.
 Nicholson's Joiner and Carpenter's Assistant.
 Bryant on Esculent Plants.
 Preston's modern English Fruit Gardener.
 Cullyer's Farmer's Assistant.
 Farmer's Magazine - Edinburgh, 7 vols.
 Dundonald on the Intimate Connexion of Agriculture with Chymistry.
 The Errors of my Age, with respect to Agriculture, by M. Cointeraux (French)
 Complete Course of Agriculture, by Rosier 10 v. (French)
 Michaux on the Oaks of the United States. (French)
 Farmer's Daily Journal, or Accountant.
 Farm accounts - consisting of ruled tables.
 Forsyth's Principles of Agriculture, 2 vols.
 Luccock on Wool.
 Anstruther on Drill Husbandry.
 Farmer's Calender, by A. Young.
 Transactions of the Horticultural Society of London.
 Young's Agricultural Survey of Essex.
 Dickson's Agricultural Magazine.
 Scott's Plates of Prize Cattle.
 White's Veterinary Medicine, 2 vols.
 Forsyth on Fruit trees.
 Epitome of Forsyth. Presented by J. Humphreys.
 Gleanings of Husbandry. do. do. (467)

Note:- No date is given for this library but it is inserted in the Memoirs between
 articles dated in 1806 and 1807.

South Carolina Agricultural Societies

There may have been in Colonial times many informal and local groups of persons interested in agriculture, who assembled from time to time to discuss agricultural subjects but who left no record of their meetings. Such a group was the Winyaw Indigo Society of Georgetown, S. C. (487) A number of planters interested in the cultivation of indigo began about 1740 to hold meetings which were largely convivial but at which they talked about the indigo industry and the means for improving it. The club prospered financially and accumulated surplus funds. At one of the meetings when the members were in a generous mood a proposition for the founding of a Charity School with manual labor features was indorsed and the school was established in 1755.

To manage this school the club was organized as the Winyaw Indigo Society and secured from the legislature an act of incorporation dated May 21, 1757, which gave them authority to "support such school or schools for the maintenance and education of such poor and helpless orphans or indigent children and for binding them apprentices." In 1795 the State gave the society confiscated property and vacant lots up to \$5,000 in value. The school flourished and became more than a charity school. "For more than a hundred years it was the chief school for all the eastern part of the country, between Charleston and the North Carolina line, and was resorted to by all classes." (487) During the Civil War the brick building used by the school was occupied by Federal troops, its library and records were destroyed and its funds were dissipated. About 1874 the school was revived but has since been merged with the high school at Georgetown.

A broader effort to establish an agricultural society was made at Charleston, South Carolina, beginning in 1784. The history of the South Carolina Society has been written by one of its members, C. Irvine Walker, in 1919. (486) In this work the Charleston Gazette of August 26, 1785, is quoted as follows:

"On Wednesday, the 24th inst., a number of gentlemen met at the City Hall for the purpose of forming a Society in this State to encourage Agriculture, according to the resolves of the meeting on the 9th inst.; when the Committee at that time appointed made a report; after which the gentlemen formed themselves into a Society, under the style and title of

THE SOUTH CAROLINA SOCIETY FOR PROMOTING AND IMPROVING AGRICULTURE AND OTHER RURAL CONCERNS:

and proceeded to the election of officers, when the following were appointed:

The Honourable Thomas Heyward, Jun., Esq.,	President
Thomas Pinckney, Esq.	Vice-President.
Peter Bonnetheau, Esq.	Secretary.

After which they took into consideration the report of the Committee and agreed to * * * Address and Rules."

These are published in the Gazette of August 25 and 29, 1785, and (485) also in a booklet issued by the Society in 1798. In the Address reference is made to European societies which have collected and published accounts of experiments and have offered prizes.

"With the same views we have instituted this Society. * * * We recommend to the planters in general to select a small part of his grounds, in order to make experiments on it by various methods."

In the Rules provision is made for an Executive Committee and the following were members of the first committee:

William Dayton, John Mathews, John Rutledge, Charles Cotesworth Pinckney, Ralph Izard, Edward Rutledge, Thomas Bee, Aaron Loockock and Isaac Harleston.

Regarding the first officers of this Society Mr. C. I. Walker, historian of the society, says:

"Very few Societies have been formed in this Country with so splendid an entourage of notably distinguished men as its officers. Of these twelve first officers of the Society, one was a Signer of the Declaration of Independence, two were United States Ministers (to Great Britain and France), one United States Senator, four were members of Congress, three were judges, one of whom was Chief Justice of the United States, four were Governors of South Carolina and five were Revolutionary officers.

The name of the Society was changed by the Act of Incorporation, which was passed by the Legislature, December 19th, 1795, to its present name, The Agricultural Society of South Carolina." (486)

Dr. John De La Howe of the Abbeville district by a will dated Sept. 7, 1796, devised the bulk of his property to the Agricultural Society of South Carolina in trust "for the purpose of establishing and maintaining forever , at his former residence in that district, an agricultural school for 12 poor boys and 12 poor girls, (479) to be boarded and clothed, as well as educated and taught to work. The desire of the testator was that scientific agriculture and especially the science of chemistry should be taught. The Society resigned the trust to the State and the legislature appointed a board of trustees. For many years the school was carried on at Lethe, the home of the testator. In 1848 the full number of boys and girls were in attendance, with half-time manual labor on farms for the boys, and housework for the girls. War swept away most of the foundation and the school was suspended. After the war it was reopened and is still going on.

"In 1798, the attention of the society was directed to the practicability of growing vineyards and producing wine and the memorial on this subject was deemed so valuable that it was published." (See Charleston Library Pamphlets Vol. 19). The society encouraged the planting of vineyards near Columbia and elsewhere but without success. Previous to 1808 the society "imported and distributed cuttings of olives, which grew well." Interest in this matter continued for a number of years. In 1828 "Thomas Jefferson addressed the society on the cultivation of olives and the manufacture of olive oil."

In 1807 a gold medal was offered "to the maker of the best experiment on the culture of rice by the water culture."

In the early days of the society cotton was grown to only a very limited extent near Charleston but in 1807 medals were offered "for the best methods of destroying or preventing caterpillars and for discharging strains from cotton."

At an early day a farm was purchased by the society but it had difficulty to raise funds to pay for it. Therefore following the custom of the times a lottery was projected in 1806 "for the payment of their farm in Charleston Neck, such other necessary buildings erected thereon and to put into full force their intention of prosecuting experiments on the same, conducive to agriculture, horticulture and botany." Ramsey's History of South Carolina says that owing to the success of a lottery the society in 1808 was "clear of debt and possessed of forty-two acres of land in the vicinity of Charleston, on which experiments are occasionally made."

However, there is no clear record of experiments there. A large wooden building on the farm was long used as a kind of club house and meetings of the Society were sometimes held there. The Society prospered and had many members scattered throughout the State. It was broken up by the Civil War but revived in 1870 and has since been a society for Charleston and vicinity.

The Pendleton Farmers' Society was organized in 1815 and chartered in 1817 and had its headquarters in Pendleton, Anderson County, South Carolina, about three (482) miles from the Calhoun estate on which Clemson College is now located. ^ John C. Calhoun was a member of the Society and when at home attended its meetings. Many other men prominent in the affairs of this region have also been members. The Society flourished and about 1828 constructed the brick building in which its meetings have been held ever since. The early records of the Society show that it was active in promoting the agricultural interests of that region and that it was in touch with the Philadelphia Society for Promoting Agriculture and other agricultural societies. In 1908 the Pendleton Society published an historical volume which contains much interesting material regarding its work, particularly during its first years.

The Kennebec (Maine) Agricultural Society

An Agricultural Society was formed at Hallowell, Maine (then Massachusetts) in 1787, probably through the efforts of Mr. Charles Vaughan.⁽²⁰⁹⁾ Hallowell was then in Lincoln County but in 1799 Kennebec County was created out of the northern half of that county. Whether the original agricultural society continued for any considerable time is not known but in 1807 there was an association called the Kennebec Agricultural Society. This was largely maintained for many years through the influence of Charles Vaughan and his brother, Dr. Benjamin Vaughan.

The father of these brothers was Samuel Vaughan of London, England, who resided for a time in the West Indies as a merchant and planter, and married Sarah, daughter of Benjamin Hallowell of Boston, who had a large estate in the town of Maine named after him.

Samuel Vaughan travelled extensively in the eastern United States between 1784 and 1787. Three of his sons spent part of their lives in the United States.

John Vaughan settled in Philadelphia about 1790 and for 65 years was secretary of the American Philosophical Society and was intimately acquainted with Washington, Franklin and Jefferson.

Charles Vaughan settled in Boston about 1785 where he was a successful merchant and a trustee of the Massachusetts Agricultural Society. He undertook large enterprises on his grandfather's lands at Hallowell, and built warehouses, wharves, dwellings, brewery and flour mill there, besides other buildings near Bath. But these undertakings were not profitable. In 1799 he moved to Hallowell and the rest of his life was spent in connection with agricultural affairs there. He and his brother, Dr. Benjamin Vaughan, carried on gardens, nurseries, orchards and farming on a large scale, distributed stock, seeds and plants and carried on correspondence with farmers.

"Charles Vaughan had the immediate care of their large estates and the carrying out of their experiments and farming operations. These were very extensive, were performed at great cost of care and money, and had for their object the improvement of the agriculture of the state as much as they did the business of their owners. No breed of stock or variety of fruit, vegetable or seed was disseminated until it had been thoroughly tested and found to be valuable and well adapted to this country." (255)

Dr. Benjamin Vaughan was born in Jamaica, West Indies, in 1751, studied at Cambridge, and law at the Temple in London, and received a medical degree at Edinburgh. In 1782 he participated in the negotiations for peace between England and the United States. In 1792 he became a member of the British Parliament but owing to political disturbance growing out of the French Revolution he went to France, Switzerland and finally to the United States. While living in London, "he edited the first edition of Franklin's writings and through his influence Franklin was induced to publish his memoirs." He settled at Hallowell, Maine, in 1796 and until his death in 1835 he was active in efforts for the promotion of agriculture there and elsewhere. He carried on correspondence with Washington, Franklin, the elder Adams, Lafayette, Michaux the naturalist, Sir John Sinclair, Arthur Young, Sir Humphrey Davy, etc.

He had an extensive library and received from England the works on agriculture printed by Arthur Young, the "Communications to the English Board of Agriculture" and works of other writers, some of which are now to be found in the Hallowell public library. In 1800 he published an edition of "The Rural Socrates", which was printed at Hallowell by Peter Edes. Arthur Young published an edition of this work in London in 1770 as a part of his book on "Rural Economy", and it had been reprinted in Philadelphia in 1775.

Dr. Vaughan published many papers on agriculture in the "Communications of the Massachusetts Society for Promoting Agriculture", the first of which appeared in 1803.

The Kennebec Agricultural Society was "a social organization which held no exhibitions for many years after its establishment but had frequent meetings for the reading of papers contributed by its members and for consultation and discussion." (209) In 1818 through the efforts of the Vaughans and others the "Maine Agricultural Society" was formed and held one or two exhibitions at Hallowell but not being able to get sufficient funds for premiums it ceased operations.

Winthrop Agricultural Society was chartered by the Massachusetts legislature Feb. 21, 1818 and held meetings and exhibitions until 1825 when it became inactive. In 1829 an organization under this name was incorporated by the Maine legislature and this in turn was merged into the Kennebec Agricultural Society in 1832.

Columbia College and the New York Society for the Promotion of Agriculture, Arts and Manufactures.

(p. 44)

The original prospectus of King's College, issued May 31, 1754, included husbandry and commerce among the subjects to be taught there. (331) "Laws and Orders" adopted by the governors of the College June 3, 1755 include "agriculture and merchandise" in the course of study. It is not known that any further action was taken at this time.

In 1762 when Dr. James Day went to England to solicit funds for King's College he found Dr. William Smith there on a similar errand for the Philadelphia College. They agreed to make a united appeal and this was done with the aid of letters patent from George III. In these letters among the objects for which the two "seminaries" were established are to instruct youth "in such Branches of Knowledge and Useful Arts as are necessary to Trade, Agriculture, and a due Improvement of our Valuable Colonies."

About this time the New York Society for Promoting Arts was organized and in 1766 offered premiums for reports on matters which the society deemed of interest to farmers.

On August 20, 1764, there was born in North Hempstead (then Plandome), Queens County, Long Island, New York, a man who was to attain a high place in the counsels of the State and the Nation and to exert a broad influence in the promotion of science, medicine and agriculture. Samuel Latham Mitchill (1764-1831) was the son of a Quaker farmer. ⁽³⁵⁴⁾ He received a classical and medical education, partly under his uncle, Dr. Samuel Latham. From 1783 to 1786 he studied science and medicine at the University of Edinburgh, and received there the M. D. degree. On his return to this country he also studied law, and Columbia College gave him an honorary A. M. in 1788. In 1790 he became a member of the New York State Assembly. In 1791 he was also instrumental in founding a library at his birthplace and took an active part in organizing the New York Society for the Promotion of Agriculture, Arts and Manufactures.

This was the first agricultural society in New York which was permanently organized, though there is reference to another New York society in the Minutes of the Philadelphia Society in 1787.

From the Transactions of the New York Society (published first in 1792 and 1794 and in revised form in 1801) we learn that "At a meeting of a respectable number of citizens, at the Senate Chamber in the City of New York, for the purpose of instituting a Society for the Promotion of Agriculture and Manufactures", a committee, which included Robert L. Livingston, Simeon DeWitt, and Samuel L. Mitchill, was appointed to prepare rules and regulations for the government of the society. ⁽⁴²²⁾ The report of this committee, with amendments, was adopted Feb. 26, 1791. Livingston was elected president. Mitchill later became one of the secretaries of the society and is so named in the Act of Incorporation passed March 12, 1793. He continued to be an officer of the society until 1810, when he was one of the vice-presidents.

In the "Rules and Regulations" it is stated that "The objects of investigation for the society shall be Agriculture, Manufactures and Arts, with such subjects of enquiry as may tend to explain, or elucidate their principles." There were to be secretaries for different districts of the State to inquire into the state of agriculture and manufactures, and to receive communications to be laid before the society; also a committee of publications. "In order to prevent imposition, the secretaries shall reject all doubtful and suspicious facts and to each article of intelligence transmitted to the Society, annex the name of the person offering it." The Society very soon issued a circular, including a list of queries on manures, soils, tillage, live stock, grain, fruit, forest trees, vermin, bees, silk-worms and manufactures. The first volume of Transactions includes an oration by Dr. Mitchill, January 10, 1792, which contains a brief discussion of a number of topics referred to in the queries, with the usual references to the classical authors. Livingston, L'Hommedieu, Simeon DeWitt and others also contributed papers.

When the New York legislature on April 12, 1792 granted funds to the Trustees of Columbia College for additional professorships, a professorship of Natural History, Chemistry and Agriculture was established and Dr. Mitchill was appointed to fill this position. On July 9 of that year the Trustees ordered that every Professor teaching by lectures publish a syllabus of his course. Under this order there appeared an "Outline of the Doctrines in Natural History, Chemistry and Economics, which, under the patronage of the State, are now delivering in the College of New York. By Samuel Latham Mitchill.

Chem. Phys. et Agricultur, in Acad. Columb. Prof.

Societat. Americ.

Philosoph. Sod. Medicin Doct. et in Republ. Nov. Eborae LXX vir. &c &c."

New York; Printed by Childs and Swaine. MDCC. XCII. (361)

This included an outline of lectures on General Geography, Geology, Meteorology, Hydrography, Mineralogy, Botany and Zoology. Extracts from this outline follow, as far as the topics related to agriculture.

Under Mineralogy; History of lime as a cement and as a manure. Account of gypsum as a cement and a manure.

Under Botany:

1-Life of Plants and Vegetation.

Farinaceous Matter of Plants -- Wheat, rye, maize, oats, peas, potatoes, etc.

Fibrous parts of plants -- Hemp, flax, cotton, hops.

Saccharine substance of plants -- Sugar-cane, apples, beets, maple, &c. Manufacture of sugar - Honey.

Products of Vegetables by fermentation -- Wines, vinegars.

Astringent parts of plants -- Art of tanning.

Agriculture or Cultivation of Plants.

- I - Soils -- Sand, clay, loam, mixtures, calcarious, mould, etc.
- II - Manures -- Lime, gypsum, dung, straw, sand, mud, fish, etc.
- III - Food -- water, earth, phlogiston, hydrogen, salt, oil, etc.
- IV -- Diseases -- Vermin, blast, smut, mildew, rust, coalgrain, drought, winter-kill - Ginnani delle malattie del grano in Erba.

Under Zoology:

- I - Functions of Animals
- II - Vis Motrix in the Vital Solid
- III - Arrangement and classification of Animals.
- IV - Chemical history of different animal substances.
 - 1 - Blood
 - 2 - Milk
 - a. Whey
 - b. Cream
 - c. Cheese
 - d. Butter
 - 3 - Fat
 - a. Hogslard
 - b. Beef-tallow
 - c. Mutton-tallow &c &c

In the Transactions of the Society for 1794 the Secretary stated that
(422)

"lectures had been given upon the different parts of the course." ^ "The class
was as numerous as could be expected, though, as it was not an undergraduate
course, few of the students of the College establishment thought it worth
their while to attend; the hearers consisting chiefly of the students of Physic. [Medicine]
But although they have constituted a Professorship, and appointed a Professor,
there are two things wanting to give proper aid to the business. The first is
an augmentation of Salary, and its permanency. 2dly - A Botanic Garden." * * *
"Likewise, by facilitating experiments on plants at this time, when a true
Theory of Nutrition and Manures is such an interesting desideratum, a Botanic
Garden may be considered as one of the means of affording substantial help to
the labors of the Agricultural Society and be conducive to the improvement of
modern husbandry."

Mitchill's report on the "State of Learning" in Columbia College,
July, 1794, is also given in these Transactions.

Under Botany, taught by Mitchill, he says, "In this course, besides
the discussion of the Linnaean or sexual system, the explanation
of terms and phrases, and the arrangement or classification of
the vegetable species, an attempt is made by the Professor, who
is a practical farmer, to elucidate and explain the economy
of plants, their affinity to animals, and the organization,
excitability, stimuli, life, diseases, and death of both classes
of beings. The physiology of plants, including their food,
nourishment, growth, respiration, perspiration, germination,
etc. is therefore particularly enlarged upon, as connected
with gardening and farming. This is a summer course." (362)

Under the Professorship of Economics, Mitchill taught Chemistry.

This was required of students of Physic and optional for other special students.
It "comprises not only the classification and arrangement of natural bodies, but
also treats of a great variety of facts which form the basis of medicine, agricul-
ture and other useful arts, as well as manufactures."

Dr. Mitchell was active in promoting the agricultural interests of New York for many years. He contributed articles on grasses, canker worms and other subjects to the publications of the State Agricultural Society and delivered addresses on agricultural subjects in different parts of the State. For this Society he made a survey on the geology and mineralogy of the Hudson River Valley, a detailed report of which was published in 1796. At different times between 1800 and 1813 he was Representative and Senator in Congress. This evidently gave him a wide acquaintance with leaders in agricultural affairs and led to his membership in many agricultural societies, including those at Sandy Springs, Md.; Culpepper, Va.; Philadelphia and Lancaster, Penn.; the Berkshire Society in Massachusetts and the Society of North Carolina. In 1824 he became professor (i.e. lecturer) of botany and vegetable physiology in the New York Horticultural Society. He was also a correspondent of the Royal Agricultural Societies of France and Austria.

Dr. Mitchill stood very high in the estimation of the medical profession. Beginning in 1796 he was for more than 20 years a Physician in the Grand Hospital of New York, assisted in the founding and editing of the Medical Repository, the first Medical Journal for the publication of original articles in this country, and "added much to medical literature". In 1807 when a charter was obtained for the College of Physicians and Surgeons he became vice-president and professor of chemistry in that institution. His knowledge of the science of his day was encyclopedic. He was also interested in literary matters, as is evidenced by his "Discourse on the state and prospects of American literature", delivered at Schenectady, July 24, 1821, before the New York Alpha of Phi Beta Kappa. Before his death considerable progress had been made in the advocacy of agricultural education in New York State and undoubtedly Dr. Mitchill should be given considerable credit for what he did in connection with the beginnings of this movement.

Among the distinguished men who were active in the early days of the New York Agricultural Society and contributed greatly to its success was Robert R. Livingston (1746-1813), its first president. He was a graduate of King's College, a member of the Continental Congress, first Chancellor of the State of New York, and Minister to France. He owned large tracts of land and was greatly interested in their use and improvement. He made many experiments, especially with lucern (alfalfa) and with gypsum as a fertilizer. Accounts of these experiments were published in the Transactions of the Society. He became interested in Merino sheep while in France and introduced them into Western New York. He was the author of an Essay on Agriculture (1809) and an Essay on Sheep (1809).

The New York Society for the Promotion of Agriculture, Arts and Manufactures continued to operate until its charter expired in 1804. By that time it had published a quarto volume of Transactions in four successive parts and also an octavo edition of the same. The legislature gave the society a new charter April 2, 1804, under which its name was changed to "The Society for the Promotion of Useful Arts". (421) Between 1807 and 1819 three octavo volumes*, mainly composed of communications read at its sessions, were published. For five years the legislature gave it funds for premiums for improvements in domestic manufacture of woollen cloths but took no action on its petitions in 1815 and 1817 for funds to encourage agriculture, the arts and manufactures more broadly and particularly through fairs. It also encouraged the formation of county societies and largely under its influence the State Board of Agriculture was established in 1819 and continued until 1826.

Apparently the members of the Society felt that this board would largely take its place in the promotion of agriculture. It ceased publishing and in 1824 united with "The Albany Lycaem of Natural History", which had been formed the previous year under the presidency of Stephen Van Rennsselaer. The combined organization was called "The Albany Institute" and continued for many years as a scientific society.

* Volumes 2, 3 and 4. Volume 1 was published under the title of the previous organization.

In 1832 by combined effort of the county agricultural societies the New York State Agricultural Society was organized. (p. 141)

The Massachusetts Society for Promoting Agriculture

The Massachusetts Society for Promoting Agriculture originated March 2, 1792 in a petition to the legislature for incorporation, signed by 28 men who were prominent in the business and political life of the State. Among them were Samuel Adams, Benjamin Lincoln, Thomas Russell, John Avery Jr., John Lowell, Charles Vaughan, and Thomas L. Winthrop. Seven were graduates of Harvard College and one of Princeton. In this petition reference is made to agricultural societies in Europe and America " whose particular business is to make experiments themselves and incite others thereto"; to give premiums for discoveries and to make them public. The act of incorporation was passed March 7, 1792 and approved by Governor John Hancock. In this act the purpose of the Society is stated to be "promoting useful improvements in agriculture". The Society was organized May 31, 1792 and officers were elected June 14. Thomas Russell was elected President and John Avery Jr. recording secretary. Charles Vaughan was a member of the first board of trustees. Among the members of the Society elected soon after its organization were John Adams, John Hancock, Timothy Pickering and Josiah Quincy. In 1853 the Secretary of the Society thus commented on its first members:

"It will be seen that the originators of the Society and its earliest members were gentlemen of the highest standing in the country, distinguished for their wealth, their learning, and their public and private virtues. * * * The Society originated in State Street * * * and its officers were well known upon 'Change'." (258)

It should also be said that many of them were directly interested in the management of farms or the development of landed estates. In a publication of the Society issued in 1892 to commemorate its centennial, among reasons given for the creation of this society were the following:

"First a desire that the new nation should keep pace with the old fatherlands in applications of the useful arts and, secondly, an aim to reach a right solution, through the way of practical wisdom, of the pressing economic questions of the hour. * * * Discontent prevailed, especially in the middle and western parts of the States, which had but lately culminated in insurrection, and all over the State there was poverty from the pinch of which few were wholly exempt, and which in many cases approached to destitution. * * * The long war of the Revolution had dissipated the accumulations of former times * * * and besides all was an enormous depreciation of legal-tender values." For example, "a farmer sold a cow in the spring for \$40 in continental money, but in the fall could make the sum go no farther than to buy a goose for this Thanksgiving dinner." (255)

Emigration to the Ohio Territory had begun and something must be done to "retain at home the most vigorous and ambitious of the farming population." Farm practice was in a primitive condition. Soils were being exhausted and yet manures were accumulating or unwisely used. About this time instances were reported in which barns were removed away from heaps of manure, which were regarded as nuisances. Though there was much ashes from fire-places their value as fertilizer was unknown. Clumsy wooden plows were still used and "four-wheeled farm vehicles were unknown". There was much moon farming, and there were no wellbred animals and little fruit.

The Society immediately undertook to raise money for premiums for the "encouragement of useful discoveries and improvements". Communications from farmers were solicited and agricultural meetings in different parts of the State were encouraged.

A committee was appointed to arrange for the publication of useful information and they were encouraged by an offer from the printer of the Independent Chronicle of Boston to print without charge advertisements of the Society.

By November 1792 subscriptions amounting to \$3,363 were reported and the first premiums were offered in March 1793 for essays on the natural history of the canker-worm and methods for destroying it.

In June 1793 a pamphlet containing a list of premiums and extracts from foreign and domestic publications was ordered printed and distributed to members and to every clergyman in the State, while 300 copies were to be sold at cost.

In February, 1794, a committee was appointed "to consider the expediency of procuring a piece of ground for the purpose of agricultural experiments."

In April, 1794, an analysis of earth said to contain marl was ordered, and when this was reported in October to be worthless, arrangement was made for experiments with marl.

On May 29, 1795, the first premiums were awarded and these were for essays on compost manures. Somewhat later W. D. Peck, who became Professor of Natural History at Harvard College in 1805, received premiums for essays on canker worms and the worm infesting fruit trees.

In 1796 application was made to the legislature "to defray the expenses of printing such papers as the Society shall think calculated to promote agricultural knowledge". The following year a library was formed and a librarian appointed.

Among the communications received that year were accounts of experiments on planting potatoes, cutting them for seed, transplanting apple trees, wheat, and the Hessian fly; and from Dr. Benj. Vaughan, "on preparing woodlands for cultivation".

Prior to 1800 several distributions of seed-wheat from different States and countries were made.

During the first eight years many communications were published in newspapers and in pamphlets issued by the Society. Among the subjects included in publications or award of premiums were the following:

"An analysis of soils, that the chemical qualities of good and poor soils being known, what was lacking in the latter might be supplied, if within the limits of reasonable cost; hemp and flax cultivation, and machines for preparing the fibre; apparatus for rapidly moving bodies of earth; improved breeding of the native sheep; cultivation of onions; raising apple trees from the seed; the management of bees; care of orchards and pruning; raising of hoop-poles; a description of Thomas Jefferson's newly invented plough and mould-board; and improvement of wild lands. A method of removing brush without ploughing, and another by ploughing and following with a peculiarly constructed harrow, were passed upon." (258)

In 1799 1,200 copies of forty-nine queries on agricultural subjects were sent out, and these were followed up until 1807 when a pamphlet of 38 pages containing answers from different parts of the State was published.

In 1801 a very important step was taken by offering a premium for sheep for breeding purposes "superior to any breed now in the State". The first premiums were awarded for a pair of Merino sheep imported from France, and for 100 Merino sheep imported from Spain, by Col. David Humphreys of Connecticut.

The same year a movement was started for the establishment of a professorship of natural history at Harvard College, and for a Botanic Garden there. \$500 was voted by the Society for this purpose and a committee was appointed to procure subscriptions for a permanent endowment. This resulted in the establishment of a professorship and a Botanic Garden in 1804-5.

"The plan, so far as connected with the objects of the society, provided for scientific observation of the growth of vegetation and of the habits of noxious insects, that methods might be devised for their destruction, and a cultivation, for sale and distribution, of the seeds and roots of useful plants. This cooperation of the society and college continued for twenty-five years, when the annual grant which had been made by the State, in aid of this part of the society's work, ceased. During the period named the society voted annually a sum of money from its own funds for the work, and appointed each year a board of visitors to report thereupon. Herein was the origin of the present "Botanical Garden" at Cambridge." (258)

In response to the first appeal to the legislature for financial aid for the professorship and Garden, the legislature granted a township of six miles square in Maine in 1805, and another township in 1809.

"In the contract with the college as to the administration of the professorship it was stipulated by the society that an acre of land should be devoted to raising seeds of culinary vegetables and producing specimens of new and useful grains and grasses."

In 1813 the Society's permanent funds, which had been contributed by members, with accrued interest, amounted to nearly \$20,000. From the interest on these funds liberal payments in premiums had been made each year.

In 1814 the legislature appropriated \$1,000 annually "for printing and circulating their publications on agriculture only; for the raising of seeds and plants, or the expense of any experiments made by them with a view to promote agricultural knowledge."

The legislature also endorsed the report of its committee regarding the usefulness of the Society as follows:

* * * "it has a tendency to diffuse knowledge and promote a spirit of inquiry and improvement, and your committee are also convinced that the said society by its premiums for introducing Merino sheep and by encouraging the introduction of new seeds and trees has already been productive of a great public benefit."

In 1816 the legislature provided for an additional appropriation of \$500 toward premiums given by the Society at its annual cattle shows.

In 1801 the Society began the publication of a series of papers, and in 1813 established the Massachusetts Agricultural Journal* which for a considerable period was issued semi-annually. The Society subscribed for the foreign and domestic journals of agriculture with a view to abstracting them for publication in its Journal.

* The bound volumes of this journal bear the title Massachusetts Agricultural Repository and Journal. The first two volumes contain papers issued prior to 1813.

As local agricultural societies were established the State Society distributed its publications to a considerable extent through them. They also sent copies of their publications to other societies in this country and abroad.

In 1810 1,000 copies of Jared Eliot's essaye on agriculture were printed for distribution.

In 1812 when agricultural conditions were bad, the Society made a special effort to stimulate general interest in improving agriculture. As part of this effort 1,000 copies of a letter to farmers were sent to town-clerks to be read in town meetings, and clergymen were asked to become honorary members and to call the attention of their people to measures for the improvement of agriculture.

In 1815 the Society became so much interested in the annual shows which were becoming popular in New England and New York that it undertook to hold a show for the whole State, and this was held first at Brighton on October 8, 1816. This was quite successful and was repeated for a number of years.

The following estimate of the success of this Society during its first quarter of a century is made in its Centennial Volume, page 41:

"Beginning with conditions of general apathy, of more or less prevalent distrust as to its intentions, and of incredulity that anything important could be gained to the farming interest, it had created a feeling of confidence as to the future of the agricultural industry and excited a spirit of inquiry. It had widely distributed thousands of pages of printed matter, supplying the best information then obtainable relating to the art; given impetus to the formation of numerous co-working societies, and printed the essays and contributed to the premiums of some of the more important among them; it had introduced new seeds and plants and choice breeds of farm animals, from foreign lands; brought new modes of farming into acceptance among leading farmers in different parts of the State, thereby exerting an exemplary influence upon others who gave to books and pamphlets no welcome; it had set fairly at work the inventive faculty of the land in devising better farming apparatus; enlisted science to search and experiment in the behest of agriculture; and, by its successful cattle show, had reached the popular heart (which is always responsive in beholding the novel and the extraordinary), thereby entering upon a radically different but most effective method of diffusing agricultural knowledge, the method of "object teaching". (255)

Elkanah Watson and the Cattle Show

Fairs after the English model, at which animals for sale were assembled and in some cases prizes given, were held in some places in the United States from early Colonial times. (See p. 130) In 1807 the "cattle show" and the organization of agricultural societies on a more popular and democratic basis were inaugurated by Elkanah Watson, who published in 1820 an interesting account of the origin and early history of this new movement. (428)

Elkanah Watson (1758-1842), a descendant of Edward Winslow, third governor of the Plymouth Colony, who introduced the first cattle into New England in 1624, was born at Plymouth and as a young man traveled from New England to Georgia and resided for some time in the Carolinas. (429) In 1779 he was sent to Paris with despatches for Franklin and traveled extensively in Europe. He returned to this country in 1784, bringing with him books sent to Washington by Granville Sharp, the philanthropist. He visited Washington at Mt. Vernon where he became greatly interested in the plans for the Chesapeake and Ohio Canal. In 1788 while on a trip along the Mohawk River he became convinced that "a canal communication will be opened sooner or later, from the Great Lakes to the Hudson".

He settled at Albany, N. Y., in 1789 and in 1791 made a trip mainly by water from Schenectady to Geneva, N. Y. His journal kept on this trip was delivered to General Schuyler, together with a plan for inland navigation in New York by using the Mohawk River and lakes, supplemented by canals. This led to an Act of the legislature in 1792 incorporating the Western and Northern Inland Lock Navigation Companies, which was the beginning of the canal policy of New York and resulted in the Erie Canal.

Watson was also interested in other means, including stage routes, for the development of the country to the West and was active in promoting education and agriculture. He was for many years in close touch with such leaders of agricultural progress as Dr. Mitchill and Chancellor Livingston of New York, John Adams of Massachusetts, and Richard Peters of Philadelphia and conducted voluminous correspondence throughout the Union and to Europe in advancing the general cause of agriculture and the organization of agricultural societies.

Becoming weary of city life at the age of 50 years Watson purchased in 1807 a farm of 250 acres at Pittsfield, Mass., to which he moved. That fall he bought two Merino sheep, the first of that breed to be brought into that region. The result is thus stated by him:

"I was induced to notify an exhibition under the great elm tree in the public square, in Pittsfield, of these two sheep, on a certain day. Many farmers, and even women, were excited by curiosity to attend this first novel, and humble exhibition. It was by this lucky accident, I reasoned thus,- If two animals are capable of exciting so much attention, what would be the effect on a larger scale, with larger animals? The farmers present responded to my remarks with approbation. We became acquainted, by this little accident; and from that moment, to the present, agricultural societies, cattle shows, and all in connection therewith, have predominated in my mind, greatly to the injury of my private affairs." (428)

The next winter he publicly urged the formation of an agricultural society to include "all the respectable farmers of the county". He then procured some relatively good pigs and a young bull, and introduced pickerel into ponds and streams in his vicinity. He was much ridiculed but on August 1, 1810 he issued "an appeal to the public" containing the following statement:

BERKSHIRE CATTLE SHOW

The multiplication of useful animals is a common
blessing to mankind. Washington.

TO FARMERS.

The subscribers take the liberty to address you on a momentous subject, which, in all probability, will materially affect the agricultural interest of this country.

* * *

In a hope of being instrumental in commencing a plan so useful in its consequences, we propose to exhibit in the square in the village of Pittsfield, on the 1st October next, from 9 to 3 o'clock, bulls, * * * It is hoped this essay will not be confined to the present year, but will lead to permanent annual cattle shows, and that an incorporated agricultural society will emanate from these meetings, which will hereafter be possessed of funds sufficient to award premiums, * * * (428)

This was signed by Watson and 26 other farmers.

This show was held October 1, 1810 and received notice in the Pittsfield Sun, partly as follows:

"The first Berkshire Cattle Show was exhibited with considerable eclat on Monday last. * * * The display of fine animals, and the number exhibited, exceeded the most sanguine hopes of its promoters, and a large collection of people participated in the display."

Fourteen farmers from different parts of the county were appointed to take measures for a "real exhibition" in October 1811. Watson "was placed at the head of a procession of farmers, marching round the square, without motive or object; having returned from whence we started, and to separate with some eclat, (he) stepped in front, gave three cheers, in which they all united."

Berkshire Agricultural Society

The following winter the Berkshire Agricultural Society was formed, "with ample powers to do good - but no funds". Watson was chosen president and devoted himself to preparing for the next show. This was held September 24, 1811 when Pittsfield "was literally crowded with people, at an early hour, by estimation three or four thousand." Watson opened the proceeding in the town house with an address - his first public speech.

"The procession was immediately formed, - it was splendid, novel, and imposing, beyond any thing of the kind, every exhibited in America. It cost me an infinity of trouble, and some cash, but it resulted in exciting general attention in the Northern States; and placing our society on elevated ground. In this procession were sixty yoke of prime oxen, connected by chains, drawing a plough, held by two of the oldest men in the county, - a band of music, - the society carrying appropriate ensigns, and each member carrying a badge of wheat in his hat, a stage drawn by oxen, having a broadcloth loom and a spinning jenny, both in operation by English artists, as it moved on, - mechanics, with an appropriate flag, and another stage filled with American manufactures. Four marshals on grey horses, headed by sheriff Larned, conducted the procession, which extended about half a mile. The pens were handsomely filled with many excellent animals. Twelve premiums, amounting only to seventy dollars, were awarded to the most meritorious. Nothing was yet offered for agriculture, - the best farmer, - or domestic manufactures." (428)

To get funds Watson went to Boston but failed in this effort. In 1812 he solicited the aid of the clergy and finally found a minister who was willing to open with prayer the meeting at which the address and premiums were delivered.

It then occurred to Watson that the women ought to take part in the show.

"The grand secret, in all our operations, was to trace the windings of the human heart, and to produce effects from every step. It was a great object to excite the females to a spirit of emulation; we were satisfied no measures would lead to that result with so much certainty, as premiums on domestic manufactures, and closing the second 'Farmer's Holiday' in 'innocent festivity', by an agricultural ball. Also, to unite them in singing pastoral odes at the church.

* * * * *

"The manner this was affected, forms a memorable, and a curious epoch in the history of this society. At the exhibition in October, the ladies of the county were invited to appear the 12th of January, 1813, with the fruits of their industry, and receive their premiums;- the day arrived, - a long room was prepared at Merrick's tavern, in Pittsfield. Many excellent articles of domestic manufactures, (especially woollens and linens), were exhibited to a considerable extent; but no female was seen to claim premiums; - this was the crisis, and I was extremely agitated, lest the experiment should fail, on which such important national results were suspended.

Such was their timidity, and dread of being laughed at; (which is a peculiar trait in people residing in the country),- none dare be the first to support a new project. To break down this folly, we had to resort to a manoeuvre, which, in one hour, succeeded to our wishes. I left the hall, proceeded one mile, and with no difficulty prevailed on my good wife to accompany me to a private room in the house of exhibition.

I then despatched messengers to the ladies of the village in every direction, that she waited for them at the cloth show; they poured forth, - farmers' wives, who were lying in wait to watch the movements of the waters, also issued forth, and the hall was speedily filled with female spectators, and candidates for premiums."

"On the second evening, the young men, by our request got up a splendid agricultural ball, being the first on this occasion, and many farmers' daughters graced the floor." (428)

In 1811 a plan for "judging farmers" by having a committee of their own number inspect their crops in July and thus determine who had the best managed farm was put into successful operation.

In 1814 Watson made personal efforts to establish town committees throughout the county but without much success.

In 1816 owing to poor health he sold his farm and returned to Albany, where he continued to use his influence to promote measures for the improvement of agriculture. He made an address at the first exhibition on the Berkshire plan held at Cooperstown in Otsego County, New York, in October, 1817, and distributed wheat entrusted to him by Governor Clinton. A similar show was held in Jefferson County in December, 1817. These shows created considerable interest throughout the State, on which Watson comments as follows:

"This excitement probably induced Governor Clinton, in January thereafter, to recommend, in his inaugural speech, the establishment of a state society, in connection with a board of agriculture, and the consequent establishment of county societies throughout the state, as objects of primary magnitude.

A joint committee of both houses was in consequence appointed to report on the important subject. I was invited to attend their deliberations in the capitol. They made a lengthy report, which is entered on the journals."

The committee recommended the establishment of a State Board of Agriculture "to consist of a professor of agriculture and chymistry; and one member from each great district" and that efforts should be made to organize county societies.

"I attended the legislature daily, during the whole winter, making every effort in my power in aid of procuring the passage of a law in promotion of agriculture."

The legislature refused to take action, whereupon Watson undertook an active propaganda by correspondence and by travel, in which he dealt especially with the county agricultural societies, several new ones having been established in 1818. In a trip to the county shows held in the fall of that year he was accompanied by Governor Clinton, Stephen Van Rensselaer and other prominent men.

Governor Clinton renewed his recommendations for a board of agriculture at the legislature of 1819 and Watson "devoted the whole of this second winter in contributing his utmost efforts to obtain a law", and this was passed near the close of the session. Pending the organization of the board Watson issued a pamphlet, "purporting to be the history of the Berkshire Agricultural Society; with practical directions for new societies". Led by the State bounty, and aided by Watson's efforts, all but six of the counties were organized by the end of 1819.

He also distributed to these societies a variety of foreign seeds sent to him by American consuls at his request. In this connection it is interesting to note that in 1818 Watson received a letter from Henry L. Ellsworth who afterward as Commissioner of Patents began the distribution of seeds from Washington. In this letter Watson was informed that he had been elected an honorary member of the newly organized Hartford Agricultural Society.

In 1820 he went about among the societies to encourage them and also held an important conference with the executive committee of the State Agricultural Society, including Dr. Mitchill. He also carried on an extensive correspondence with societies being formed in other States, including New England, North Carolina, Virginia, Maryland, Kentucky, Illinois and Ohio.

Watson's Petition for a National Board of Agriculture

In 1816 Watson drew up a petition to Congress for a National Board of Agriculture. This was transmitted through the president of the Berkshire Society to Congressman John W. Hulbert and was agitated in Congress by him and others but without definite result. (p. 137)

In a letter to Jesse Buel December 1, 1825, he advocated "a grand agricultural and literary institution" at Washington with branches in the States. (See Memoirs of the Board of Agriculture of the State of New York, vol. 3, p. 524. Albany, 1826.)

In 1823 he moved to Port Kent, New York, on Lake Champlain, where he was the chief founder of a village, and was active until his death in promoting agricultural and other development of Northern New York.

In 1837 he attended the 27th anniversary of the Berkshire Society and made what was probably his last public address.

Agricultural Societies in Connecticut

In the minutes of the Philadelphia Agricultural Society for October 3, 1786 it is stated that the Society was informed of the establishment in Connecticut of a Society for Promoting Arts, Manufactures and Agriculture, which requested correspondence. There is no further record of this organization, which may never have come into actual operation.

From the Transactions of the Society for Promoting Agriculture in the State of Connecticut, published in 1802, we learn that "a number of citizens, from different towns in the State of Connecticut, convened at Wallingford, on the 12th day of August, A. D. 1794, for the purpose of forming a Society for promoting Agriculture; and having shown their approbation of the plan proposed, appointed a committee to draft a Constitution for the Society and report at the next meeting". (156) November 11, 1794 this committee reported "rules and regulations" which were adopted as the constitution of the society. In these rules it is stated that "the object of investigations for the society, shall be Agriculture, with such subjects of inquiry as may tend to explain its principles." Provision was made for reports from members on the state of agriculture in their localities, including experiments and discoveries; and for publications. A considerable list of queries on a variety of agricultural subjects was compiled and disseminated. Brief reports of experiments and observations on a number of these subjects were printed in these Transactions. "Many experiments have been made by the members themselves, and their observation has extended to the improvements of their neighbors."

Connecticut being a State of large population and small farms it was very important that landholders should "enrich the soil they cultivate and extend its produce". Therefore this Society laid emphasis on experiments and "an interchange of sentiment" regarding their results.

The records of the New Haven County Agricultural Society "show that in 1803, 'A Society for promoting Agriculture' was formed at New Haven, of which General James Wadsworth was president until 1813" and later President Dwight of Yale College, David Humphreys, and Eli Whitney held this office.

David Humphreys (1752-1818) was a soldier in the Revolutionary War and the War of 1812, and for a time was aide-de-camp to General Washington. After the war he spent a year at Mt. Vernon. He was minister to Portugal, Algiers and Spain between 1791 and 1802. Prof. William H. Brewer writes regarding his introduction of Merino sheep, as follows:

"David Humphreys' special service to agriculture lies in his having been the first to introduce to America a flock of Merino sheep and establish them here for the production of wool, and to start the manufacture of fine woolens. In 1801, he secured a flock of about twenty-five rams and seventy-five ewes in Spain, drove them into Portugal, and, with Spanish shepherds, shipped them from Lisbon to a farm in the Naugatuck Valley, Connecticut. Here he established a woolen mill, and made the first broadcloth in America. He sold Merinos from his flock to other sheep-breeders for grading the wool."

On Sept. 12, 1816 General Humphreys made an address before the Society at New Haven "on the Agriculture of the State of Connecticut and the Means of Making it More Beneficial to the State", in which he refers to benefits which agriculture may derive "by making Chemistry subservient to the promotion of rural economy" and by taking advantage of the "garden of indigenous and exotic plants" then recently established at New Haven, from which the farmer may
(145)
carry "seeds and plants to improve his farm". Part of this address deals with a memorial to the legislature which the Society had adopted asking that a portion of the bonus received by the State in connection with the establishment of the Phoenix Bank be used for "encouraging and advancing the agricultural interests of the State".

In 1817 the Hartford County Agricultural Society was formed with Henry L. Ellsworth, afterwards U. S. Commissioner of Patents, as secretary. Societies in the other counties were organized later and in 1852 the Connecticut State Agricultural Society was formed under an Act of the legislature passed that year.

Early Societies in New Hampshire

The legislature of New Hampshire in 1814 granted a charter to an agricultural society in Rockingham County, which had its seat at Chester or Exeter. In 1817 there were county agricultural societies in Rockingham and Cheshire Counties, each of which received a State appropriation of \$100. Similar societies were organized and chartered that year in Hillsboro and Strafford Counties and soon thereafter in Grafton and Coos Counties. In 1819 and 1820 all the counties had societies which held fairs and received State aid. Up to 1820 the annual appropriation to each society ranged from \$100 to \$300 and in all \$3,000 had been expended by the State.

Virginia's Great Agricultural Leaders

George Washington

George Washington (1732-1799) was early imbued with the traditional ideas which Englishmen like his father and Lord Fairfax had regarding the desirability that a gentleman should possess a large tract of land. (503) Therefore by inheritance, marriage, purchase and award for services in the French and Indian War he had built up his estate until at his death he owned over 60,000 acres in Virginia, Ohio, Pennsylvania and New York. The Mt. Vernon property alone contained over 8,000 acres. This seems to us a very large acreage for one man to own, but Lord Fairfax had over 5,000,000 acres.

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Much of Washington's land had never been cleared of its forests or touched by the plow; some had very recently been put under cultivation under pioneer conditions, while other tracts and particularly the Mt. Vernon farms had on them land which had been farmed for a century or more. Washington therefore was interested in all phases of agriculture, including the utilization of forests, cutover lands, virgin meadows, swamp-lands, and soils which through bad management were largely exhausted. He had also many and great problems of farm management. His laborers were for the most part either negro slaves or indentured white people practically in involuntary servitude. Hundreds of such people had to be fed, clothed, and generally cared for in sickness and health by the master to whose land they were attached. They were not only to do ordinary farm work but also to carry on the various mechanical trades and domestic industries in shops, mills and houses as was necessary to self-sustaining farm communities. Then there were the perplexing problems connected with the employment of overseers and the dealing with pioneer renters largely without capital and liable to all sorts of misfortunes.

Farm implements were crude and clumsy, draft animals were relatively few and inferior, and live stock in general was ill-bred. On the average one man was required for each two or three acres. The planter generally raised the food for his family and slaves, and the raw material for their clothing. Only the luxuries were purchased and these largely came directly from abroad.

In Virginia tobacco was the principal money crop and this crop was ruinous to such soils as those of Mt. Vernon. The common rotation was with corn and this did not help the situation. There was little planting of other grains or grasses and manure was insufficient and poorly used. Commercial fertilizers were unknown.

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Washington was not content to follow the ordinary farm routine which his neighbors practiced. He early determined to study and experiment with a view to improving agricultural conditions for himself and farmers generally. While he began with tobacco as his money crop, he changed to wheat and flour with special reference to trade with the West Indies and afterwards became largely engaged in growing forage crops and live stock.

He became a "book farmer", not only reading carefully such agricultural books as he could get principally from abroad, but making detailed notes of some of them. This was particularly true of Tull's Horse-Hoeing Husbandry; Duhamel's, A Practical Treatise of Husbandry; the Farmer's Compleat Guide; Home's The Gentleman Farmer and Young's Annals of Agriculture (after 1784).

He carried on an extensive correspondence with men in England acquainted with improved farm practices and particularly with Arthur Young and Sir John Sinclair.

Beginning as early as 1760, he made many experiments on the Mt. Vernon estate in two periods, before and after the Revolutionary War. Among the earlier experiments were those in growing alfalfa (lucerne), clover, timothy, spelt and various other grasses and vegetables; soaking seed wheat in brine and alum to prevent smut; methods of protecting grain against the Hessian fly and rust; different dates for harvesting wheat; use of marl on wheat land and salt on fallow ground.

In later times experiments with alfalfa were continued and in 1798 he had a considerable field of this crop. There were also experiments with methods and dates of planting corn, potatoes, wheat, etc.; crops supposed to strengthen land; varieties of wheat from different sources; plaster of Paris and powdered stone; mud from the Potomac River; different amounts of seed; and rotation of crops. He was much interested in getting and trying improved implements and himself devised a "barrel plough" or drill. "At his death he owned not only threshing machines and a Dutch fan, but a wheat drill, a corn drill, a machine for gathering clover seed and another for raking up wheat". He undertook to grow many kinds of fruits, trees and ornamental plants collected from various countries, including some purchased from the botanist, John Bartram of Philadelphia.

He maintained a conservatory and a small botanical garden and had many experimental plats on various plantations. As a stockman he was especially interested in horses, mules and sheep, and tried to improve their breeds. He introduced mules from Spain and Malta and made ~~breeding~~ experiments with them.

His experience as a farmer and experimenter convinced him that improvement of agriculture was of such fundamental importance to the growth and prosperity of the United States that the public ought to share in the maintenance of agencies for this purpose. He therefore gladly associated with the Philadelphia Society for Promoting Agriculture as a beginning of effort in this direction. He was much impressed with what England was doing under the leadership of Sinclair (p. 30) through the British Board of Agriculture established in 1793. And three years later as President of the United States he recommended to Congress the establishment of a similar board in this country.

The following extract from a letter to Sir John Sinclair from Philadelphia July 20, 1794, illustrates Washington's interest in measures for the improvement of agriculture:

"I know of no pursuit in which more real and important services can be rendered to any country, than by improving its Agriculture - its breed of useful animals - and other branches of a husband-man's cares; nor can I conceive any plan more conducive to this end, than the one you have introduced for bringing to view the actual state of them, in all parts of the kingdom, by which good and bad habits are exhibited in a manner too plain to be misconceived; for the accounts given to the British board of Agriculture, appear in general, to be drawn up in a masterly manner, so as fully to answer the expectations formed in the excellent plan which produced them; affording at the same time a fund of information useful in political economy - serviceable in all countries.

* * * * *

"It will be some time I fear, before an agricultural Society with Congressional aids will be established in this country; we must walk as other countries have done before we can run. Smaller Societies must prepare the way for greater, but with the lights before us, I hope we shall not be so slow in maturation as older nations have been. An attempt, as you will perceive by the enclosed outlines of a plan, is making to establish a State Society in Pennsylvania for Agricultural improvements. If it succeeds, it will be a step in the ladder, at present it is too much in embryo to decide on the result.

"Our domestic animals, as well as our Agriculture, are inferior to yours in point of size; but this does not proceed from any defect in the stamina of them, but to deficient care in providing for their support; experience having abundantly evinced that, where our pastures are as well improved as the soil and climate will admit; where a competent store of wholesome provender is laid up, and proper care used in serving it, that our horses, black cattle, sheep, &c. are not inferior to the best of their respective kinds which have been imported from England. Nor is the wool of our sheep inferior to that of the common sort with you: - as a proof, after the peace of Paris in 1783, and my return to the occupation of a farmer, I paid particular attention to my breed of sheep (of which I usually kept about seven or eight hundred). By this attention, at the shearing of 1789, the fleeces yielded me the average quantity of 5 l-4 lbs. of wool; a fleece of which promiscuously taken, I sent to Mr. Arthur Young, who put it, for examination into the hands of Manufacturers. These pronounced it to be equal in quality to the Kentish wool. In this same year, i. e. 1789, I was again called from home, and have not had it in my power since to pay any attention to my farm; the consequence of which is, that my sheep, at the last shearing, yielded me not more than 2 l-2 lbs.

This is not a single instance of the difference between care and neglect. Nor is the difference between good and bad management confined to that species of stock; for we find that good pastures and proper attention, can, and does, fill our markets with beef of seven, eight and more hundred weight, the four quarters; whereas from 450 to 500 (especially in the States south of this, where less attention hitherto has been paid to grass), may be found about the average weight. In this market, some bullocks were killed in the months of March and April last, the weights of which, as taken from the accounts which were published at the time, you will find in a paper enclosed. These were pampered steers, but from 800 to a thousand, the four quarters, is no uncommon weight.

Your general history of sheep, with observations thereon, and the proper mode of managing them, will be an interesting work when completed; and with the information, and accuracy, I am persuaded it will be executed, under your auspices, must be extremely desirable. The climate of this country, particularly that of the middle States, is congenial to this species of animal, but want of attention to them in most farmers, added to the obstacles which prevent the importation of a better kind, by men who would be at the expence, contributes not a little to the present inferiority we experience.

Mr. Edwards would have it as much in his power as most of our farmers, to solve the queries you propounded to him; in addition to which, a gentleman of my acquaintance (who is also among the best farmers of this country), to whom I gave the perusal of your propositions, has favoured me with some ideas on the subject, as you will find on a paper, herewith enclosed.

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The sample you were so obliging to put into the hands of Mr. Lear, for me, of a Scotch fabrick, is extremely elegant, and I pray you to accept my thanks for it, as I entreat you also to do for the civilities shown to that gentleman, who has had a grateful sense of them.

Both Mr. Adams, and Mr. Jefferson, had the perusal of the papers which accompanied your note of the 11th of September. (522)

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John Marshall and the Society of Virginia for Promoting Agriculture.

As early as 1811 an organization called "The Society of Virginia for Promoting Agriculture" was formed at Richmond and in 1818 published a volume (508) of "Memoirs". Its membership included many of the most eminent men of the State.

John Marshall (1755-1835), who had first studied law and natural philosophy at William and Mary College in 1780 and in 1811 was Chief Justice of the United States Supreme Court, was the first president of this Society. His homestead was in Fauquier County though his residence for most of his active life was in Richmond. That he had a continuing interest in the Society is shown by the fact that in 1818 he was chairman of its corresponding committee.

In its "Laws" it is stated that "the attention of the Society shall be confined to Agricultural and Rural Affairs". Papers presented in 1811 on the culture of hemp, the preparation of tannin for exportation, and the preparation of land for crops, etc., in reply to "queries" sent out by the Society, are included in the Memoirs.

In 1818 the president was Colonel John Taylor (1750-1824), of Caroline, long an active worker and ruling spirit in the cause of agricultural improvement in Virginia and well known as the author of the collection of agricultural essays, originally published in the "Spirit of Seventy-six" in 1809 or 1810 and first brought together under the title of Arator in 1813. (511) He was born in Orange County but later removed to Caroline County. He graduated at William and Mary College in 1770 and studied law. He was an officer in the Revolutionary War and served several times in the Virginia house of delegates and in the United States Senate. He was the author of several works on government which Jefferson considered "indispensable to the statesman or the philosopher". He also wrote articles covering a wide range of subjects for the Richmond Enquirer, American Farmer (after 1819) and other papers.

REPORT OF THE COMMISSIONER OF THE GENERAL LAND OFFICE

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REPORT OF THE COMMISSIONER OF THE GENERAL LAND OFFICE

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In a series of essays in Arator on "the political state of agriculture", in which he deploras the relatively low esteem and influence of farmers in governmental affairs, he says that "if the suggestion of establishing agricultural societies in each Congressional district, for the purpose of explaining respectfully to Congress what does it good and what does it harm, in imitation of other interests, should be adopted by Agriculture, it may at least acquire the capacity of distinguishing between good and evil." (512)

In an address as president of the Virginia Society, June 8, 1818, he avers that "the chief obstacle to the success of a society for promoting agriculture in Virginia is the morbid aversion to writing on that subject for publication" and expresses the opinion that "writing, printing and publishing are even more necessary for the improvement of agriculture, than for the civilization and good manners of mankind." "Laws may affect Agriculture as well as commerce or manufactures; and hence as powerfully require the attention of a society confined to that special subject." The "Memoirs" also contain papers by him on "artificial grasses" and on necessities, competency and profit of agriculture". (508)

Under his leadership the Virginia Society offered prizes for accounts of "actual experiments and improvements" and for articles on subjects proposed by the Society. As a central society at the State capital it also encouraged the formation of societies in other parts of the State.

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Thomas Jefferson and the Albemarle Society

Among the distinguished men of Virginia who in their way were leaders (p. 50) in the promotion of agriculture was Thomas Jefferson (1743-1826). He was brought up on his father's estate near Charlottesville, later known as Monticello. This included at one time more than 1,000 acres. From his earliest days, therefore, he was familiar with agricultural operations conducted on a large scale. He inherited Monticello and on the death of her father his wife brought to him landed property, said to have exceeded 50,000 acres, attached to which were 135 slaves.

Throughout his active life he was responsible for the management of farms. He was greatly interested in the natural sciences, particularly botany. His botanical library became one of the best in America. He was in touch with scientific men in this country and abroad. For a number of years he was president of the American Philosophical Society. After the Louisiana purchase he proposed that this society should organize a scientific expedition from St. Louis up the Missouri River to the Pacific. The French botanist Michaux was engaged for this work and got as far as Kentucky when he was recalled by the French government.

When the Lewis and Clark expedition was undertaken in 1803 under government auspices Jefferson made arrangements by which it made scientific collections. In Jefferson's Notes on Virginia, published in 1782, "the chapter dealing with the flora of the State gives lists of medicinal, esculent, ornamental and otherwise useful native plants."

His scientific interest and study led him to approach agricultural problems from a somewhat different standpoint from that of Washington. He was more theoretical and less practical but in the main his influence on agricultural affairs was very beneficial. Many of his letters contain references to agricultural affairs. A few examples will illustrate the range of his agricultural interests. (523) In a letter to John Jay, August 23, 1785, he says, "Cultivators of the earth are the most valuable citizens. They are the most vigorous, the most independent, the most virtuous, and they are tied to their country and wedded to its liberty and interests by the most lasting bonds." From Monticello April 25, 1794, he wrote to the President of the United States - "I return to farming with an ardor which I scarcely knew in my youth and which has got the better entirely of my love of study." Seventeen years later he declared "No occupation is so delightful to me as the culture of the earth and no culture comparable with that of the garden." In a letter to David Williams November 14, 1803, he made the following argument in favor of agricultural education as a means of keeping capable men on the farm:

Agriculture "is a science of the very first order. It counts among its handmaids the most respectable sciences; such as Chemistry, Natural Philosophy, Mechanics, Mathematics generally, Natural History, Botany. In every College and University, a professorship of agriculture, and the class of its students, might be honored as the first. Young men closing their academical education with this, as the crown of all other sciences, fascinated with its solid charms, and at a time when they are to choose an occupation, instead of crowding the other classes, would return to the farms of their fathers, their own, or those of others, and replenish and invigorate a calling, now languishing under contempt and oppression." (523)

Other letters deal with rotation of crops, use of legumes such as peas, cow-peas and vetch, manure, yield of wheat and corn, prices of farm products, introduction of Merino sheep, wages of farm laborers, employment of overseers, etc.

He was especially interested in the improvement of farm implements and purchased or constructed plows, drills, threshing machines, etc. He made a special study of the plows in 1798 "and wrote a treatise upon the requisite form of the mold-board, according to scientific principles, calculating the exact form and size and especially the curvature to lessen the friction."

Partly through association with such men as Franklin, John Adams and Robert R. Livingston and his observations while in Europe he became much interested in scientific and agricultural societies. In a letter to Livingston January 3, 1808, with reference to copies of the Proceedings of the New York Agricultural Society which had been sent to him, he says, "Writings in this subject -agriculture are peculiarly pleasing to me. * * * It is among my most fervent longings to be on my farm, which, with a garden and fruitery, will constitute my principal occupation in retirement. I have lately received the proceedings of the Agricultural Society of Paris. * * * The society has lately published Olivier de Serres' Theatre d'Agriculture. It is the finest body of agriculture extant."

In 1811 he drew up an elaborate plan for a state agricultural society and county societies in Virginia. This he was able to use later in connection with the formation of a society in his home county, known as The Albemarle Agricultural Society.

From the Minute Book of this Society we learn that

"Pursuant to a proposition for a meeting to form and organize a Society to promote the interests of Agriculture and Rural and Domestic economy in general, a meeting of sundry Gentlemen took place to effect that object at Charlottesville on Monday the 5th day of May, 1817, when Gen. John H. Cocke was called to the chair, and Peter Minor appointed Secy." (516)

In his article on the "Early Days of the Albemarle Agricultural Society", Dr. Rodney True points out that - "In this group of 30 men was one who had served his country eight years as its honored President, two others who were to be governors of Virginia, still another who was to represent that State in the United States and his country at the court of St. James, and another who closed his career on the Supreme Bench of the United States." (516)

There was also a brigadier-general and a future head of the University of Virginia. This group came from five counties and ultimately Fairfax and the Great Valley were included in the membership. A committee of which Jefferson was chairman was appointed to draft rules and regulations for the society. These were reported, together with a statement of the objects of the society taken from Jefferson's previous plan for societies, and with some amendments were adopted Oct. 7, 1817. Each member was asked to report on his own practices in agriculture and rural economy and a list of queries was prepared. Plans were made for a nursery of fruit trees and a manufactory of implements, particularly improved plows. The nursery and manufactory were primarily for members of the society, but were also open to the public. The Richmond Enquirer was made the organ of the society.

James Madison (1751-1836) was the first president of the society and (504 and 506) continued in that office until 1824. ^ His home was in Orange County where his father had an estate of 4,675 acres. In 1784 his father deeded to him 560 acres but the son never lived on this farm. Instead he lived at home and virtually managed the whole estate during a considerable portion of his father's life. Finally he inherited 1,800 acres of the homestead to which the name of Montpelier was given, a farm of 475 acres in Culpepper County, about 100 acres in Louisa County and great tracts in Ohio and Kentucky. He was greatly interested in scientific studies of plants and animals. Among other things, he read Buffon's great work on natural history and wrote notes and comments on this. At Montpelier "he embarked with zeal in every plan for the improvement of agriculture and its processes."

His main money crop was tobacco but "he was fond of experimenting and assisted the experiments of others." He was a horse breeder on a moderate scale and experimented with mules. On the advice of Robert R. Livingston he raised Merino sheep. He took much interest in his garden and through Latrobe he procured a great variety of vegetable seeds. He built the first ice-house in his region. He had Tull's book on Horse-hoeing husbandry and wrote Jefferson regarding his crops and plows, discussing the theory of the plow which Jefferson had proposed. In their varied correspondence, which covered many years, there are numerous allusions to agriculture and rural life.

After his retirement from the presidency of the United States he lived at Montpelier for nearly twenty years and took a great interest in the promotion of agriculture and education to the end of his life.

On May 12, 1818 he delivered an address before the Albemarle Society on "the nature and principles" of its objects and on the prevailing errors in agricultural practice which the society sought to remedy.

The society prospered, published many papers in the Richmond Enquirer, conducted fairs and exhibitions with prizes for agricultural implements, live stock and domestic manufactures, interested itself in the development of the University of Virginia and endeavored to obtain funds for a professorship of agriculture in that institution. (P. 232) Its existence covered a period of over 30 years and until its place was taken by other organizations.

Edmund Ruffin and the Virginia State Agricultural Society.

In the decade beginning with 1826 a number of agricultural societies were formed in Virginia. On January 11, 1836 a convention was held at Richmond, which prepared a memorial to the legislature asking for the establishment of a State Agricultural Society and a Board of Agriculture. In this memorial reference is made to the success of the New York Agricultural Society. In 1841 an act was passed creating the Board but this was repealed the next year. An act authorizing the creation of a State Agricultural Society was passed in 1845 but not until 1850 was definite action taken looking to the formation of this society. Even then the movement was so feeble that the organization could not get a charter from the legislature nor obtain public or private funds to hold a fair.

Then another of Virginia's great agricultural leaders took the matter in hand. Edmund Ruffin (1794-1865) had attained great influence in agricultural affairs by his activity in experimenting on his own estate, and particularly his work on soil acidity and the use of marl as a calcareous manure. His experiments in this line were first published under the title of "An Essay on Calcareous Manures" in 1821 in the American Farmer and afterwards in a book which reached the fifth edition in 1852 and is "probably the most thorough piece of work on a special agricultural subject" in the English language. (See U. S. D. A. Yearbook 1895, p. 500.)

From 1833 to 1842 he published a monthly journal called the Farmers' Register which was widely read. (510) He was greatly interested in the establishment of a State Board of Agriculture and when that finally came about he was a member and afterward its secretary. Disgusted with the slow progress in the formation of the State Agricultural Society he brought about a convention of farmers on February 19, 1852, secured the cooperation of the officers and friends of the society already nominally organized, and succeeded in creating a new organization (520) called the Virginia State Agricultural Society. He was president of the convention and later of the society. This organization promptly got into active operation and held its first fair in 1853. At that time Ruffin wrote an essay on agricultural education for which the society gave him a prize. (507)

Early Agricultural Societies in the District of Columbia

An account of early movements under unofficial auspices in the District of Columbia is given in an article on the "History of the Agriculture of the United States", by Ben: Perley Poore, in the Report of the Department of Agriculture, 1866, from which the following extracts are taken:

"The Society for Promoting Public Economy.

Early in the year 1806, Joel Barlow, esq., then residing at Kalorama, in the vicinity of Washington, published the prospectus of a 'national academy', in which he enumerated, among the foreign institutions to be copied in forming an American organization, the agricultural societies of England and the veterinary school of France. (See p.)

Meanwhile an institution had been organized by 'members of Congress, officers of the federal government, and others, devoted to objects connected with public economy'. Meetings were held at Mr. Hervey's on Pennsylvania avenue, every Saturday evening, from five until eight o'clock, and among the subjects considered were:

Our mechanical economy, or the means of abridging labor by useful inventions, implements, and apparatus.

Our agricultural economy, or the means of producing the most abundant and most reciprocal crops, under any given circumstances, without doing things by guess.

The economy of our forests, or the best management of our latent resources there.

This was probably the association alluded to in the proceedings of the Philadelphia Society for the Promotion of Agriculture, on the 8th of April, 1806, when Dr. Mease, in describing a machine for hulling clover, recommended that the account "be published in the newspapers, and communicated to the Agricultural Society at Washington."

"The Columbian Agricultural Society

In 1809 a number of gentlemen interested in agriculture, residing in Maryland, Virginia, and the District of Columbia, after several meetings, carefully organized the Columbian Agricultural Society for the Promotion of Rural and Domestic Economy. As the germ of a national organization embracing different States, and as the initiative of agricultural exhibitions, now one of our national institutions, this society's operations are entitled to an honorable record. The National Intelligencer, in publishing its first premium list, said: 'Attaching the highest importance to the active development of our internal resources, and convinced that they are the mainspring of the permanent prosperity of the United States, it is with unfeigned pleasure that we insert a statement of the plan and measures of an association whose respectability, zeal, and intelligence are the best pledges for its utility.

The first exhibition of the Columbian Agricultural Society was held at the Union Hotel, Georgetown, on the 10th of May (1809?). It was (said the National Intelligencer of the following Friday) 'attended by a numerous assemblage of members of the society, among whom we noticed the President and his lady, the Secretary of State, the Secretary of the Treasury, the Secretary of War, the Comptroller, Register, &c., and many other ladies and gentlemen of respectability. This is the first exhibition held by the society, which bids fair to exceed anything of the kind in the United States, and promises to be of great utility in the promotion of the agricultural arts, and particularly of the domestic manufactures of cotton, wool, and flax, by exciting a competition which cannot but be productive of good effects.

There were exhibited a great number of sheep of the best breeds, among which were several half and three-quarter breed merinoes. At half past eleven o'clock the room for the exhibition of domestic fabrics was thrown open, when many specimens were displayed highly honorable to the industry and ingenuity of those who produced them, and gratifying to those who have at heart the cultivation of the resources of the country. Some specimens of diaper, bed-ticking, and cotton-bagging were particularly admired as equal to any imported. The result of the day was highly pleasing to all concerned; and the auspicious commencement of this patriotic institution furnishes another, in addition to the many evidences already existing, of the public spirit of the District.

A venerable gentleman who was present described the scene to the writer of this paper as one of great interest, the more especially as nearly every person present wore clothing of domestic manufacture. President Madison sported his inauguration suit, the coat made from the merino wool of Colonel Humphreys' flock, and the waistcoat and small-clothes made from the wool of the Livingston flock at Clermont. General John Mason, then United States Indian agent, wore a suit of nankeen, made from nankeen cotton raised on Analostan island. The sheep were arranged in pens in the large yards of the hotel (under the direction of Mr. Crawford) and there were also several fine horses on exhibition, among them Dr. Thornton's 'Carlo'. This was a large, brown bay horse, (imported by Robert Waln, who had been a member of Congress from Philadelphia) with a pedigree reaching back thirteen generations to the Layton Arabian mare, and enriched by crosses with the best stock in England. My informant recollected distinctly the admiration expressed by Mr. Madison after examining the horses and sheep." (563)

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Five other semi-annual exhibitions were held, but when the war of 1812 came on it "overshadowed everything else and as the time had expired for which the society had been organized, it was dissolved."

The Columbian Society also undertook the publication of a periodical entitled "The Agricultural Museum", the first number of which was published at Georgetown, July 4, 1810. (161) Among other things this publication contains the constitution and proceedings of the society.

The Columbian Institute for the Promotion of Arts and Sciences

On June 15, 1816, an association called the Metropolitan Society was formed by 89 residents of Washington, D. C., under the leadership of Dr. Edward Cutbush and John Law. When a constitution for this society was adopted August 8, 1816, its name was changed to Columbian Institute for the Promotion of Arts and Sciences". It was to make collections of plants and minerals, obtain information regarding mineral waters and "form a topographical and statistical history of the different districts of the United States". It also intended to cultivate and distribute plants and "to invite communications on agricultural subjects, on the management of stock, their diseases and the remedies". Congress gave it a charter April 20, 1818, the use of 5 acres of land for a botanic garden in 1820 and four years later a room in the Capitol for its meetings and collections. Its first president was Dr. Cutbush and later that office was held by John Quincy Adams and John C. Calhoun. The society was quite active for about 10 years and hoped to secure public or private funds to establish a museum and library but it did not acquire any substantial means and went out of existence on the expiration of its charter in 1838. A botanic garden was begun on land located at the east end of the Mall near the Capitol and its area was extended in 1824 to include the present site of the United States Botanic Garden. In 1830 it was reported that more than 1,000 trees and shrubs had been planted. In 1828 distribution of seeds, including varieties of wheat and barley, was begun and continued for several years.

In 1850 an enlargement of the Patent Office building necessitated the removal from that locality of the greenhouses containing the living plants brought home by the Wilkes Exploring Expedition. They were transferred to the land formerly used by the Columbian Institute and thus the present Botanic Garden was begun. A history of the Institute is given by Richard Rathbun in Bulletin 101 of the United States National Museum.

Early Agricultural Fairs

It is uncertain when the first attempts were made to hold agricultural fairs or exhibitions in this country. Mention is made of a fair for the sale of agricultural products in New Haven, Conn., in 1644 and at Weathersfield, Conn., in 1784. In an article entitled "One Hundred Years' Rural Progress", published in 1877, James O. Adams, Secretary of the New Hampshire Board of Agriculture, states that the first cattle show in that State was held at Rye, Rockingham County, about 1726.

In South Carolina at Strawberry in St. John's Parish, in Berkeley County, a fair was established by an act of 1723, to be held "at least twice in every year for exposing for sale horses, cattle and merchandise". Connected with these fairs there shall be "a Court of Pipowder with liberties and customs of Fairs such as are holden in South Britain or England". This was a petty tribunal held during the fair, where persons were not liable to arrest except for "treason, felony or other capital crime, or breach of the peace".

Semi-annual fairs were authorized by statute at Alexandria, Virginia, in 1742 and in Georgetown, Maryland, when that town was laid out in 1751.

The Maryland Gazette of September 7, 1747, contains a notice from which the following statements are taken:

"Whereas there is a fair appointed by Act of Assembly to be held in Baltimore Town on the first Thursday, Friday and Saturday in October, the Commissioners of said town hereby give notice 'that whoever brings the best steer will receive 8 shillings and there will be a prize for the horse race. There will also be a bounty of 40 shillings for the best piece of yard-wide country-made linen. On Saturday a hat and ribbon will be cudgelled for; a pair of pumps wrestled for; and a white shift be run for by negro girls. There will be no arrests during the Fair except for felony or breach of the peace'." (109)

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From early times horse racing was a favorite sport in the Southern colonies.

At Charleston, South Carolina, a saddle was offered as a prize in connection with a race at a fair in 1737. From Smyth's travels in Virginia in 1773 we learn that "there are races at Williamsburg twice a year and almost at every town and considerable place in Virginia."

Regarding the first fair at Washington and the sheep shearing festival at Arlington, Poore wrote as follows:

"In 1804 it was suggested by Dr. Thornton*, the first Commissioner of Patents, then residing in Washington, which was literally a 'city in the woods', that the ready sale of cattle and of domestic products could be promoted by the holding of fairs or market days, as in England, his native land. The idea met with the warm approval of the citizens, and the municipal authorities passed an act establishing semi-annual fairs. An editorial article on the National Intelligencer, of October 17, spoke of the coming fair as offering advantages to purchasers and to settlers, 'while at the same time it can but prove equally beneficial to the agricultural interests of our country'.

"The fair was held on Wednesday, Thursday and Friday, on 'the mall at the south side of the Tiber, extending from the bridge at the Centre market to the Potomac'. 'It was a decided success', and before the next one was held an attempt was made by additional legislation on the part of the city government to increase its usefulness by appropriating fifty dollars towards a fund for premiums. The citizens raised by subscription an equal sum, so that at the fair, which began on the 26th of April, 1805, 'premiums to the amount of one hundred dollars were awarded to the best lamb, sheep, steer, milk cow, yoke of oxen, and horse actually sold'. A third fair was held in November, 1805, after which they were discontinued." (563)

Following the importation of Merino sheep into this country, a kind of rural festival called "sheep shearing" was created and became quite popular. These affairs were in imitation of meetings of farmers held by Coke of Holkham, in Norfolk, England, beginning in 1778.

"Prominent among these 'Sheep shearings' were those established, [in 1802] and continued for a dozen years, by George Washington Parke Custis, at 'Arlington', his estate opposite Washington, on the Virginia side of the Potomac. Those associated with him in after life in the 'United States Agricultural Society', will not wonder that large collections of prominent men used to accept his hospitable invitation to be present at these gatherings, where he entertained his guests beneath the marquee used throughout the Revolution by his illustrious guardian, George Washington. A programme of one of these rural festivals, as published in the Georgetown paper of the day, merits preservation.

PREMIUMS AT ARLINGTON ON THE 30th OF APRIL, 1809

Sheep:

For the best tup-lamb, of one year, a silver cup, value sixty dollars.

For the best pair of ewes, of same age, a silver cup, value forty dollars.

Principle established:

To the sheep which shall possess the best form, and yield the most and best wool in proportion to its size, the premiums will be adjudged.

To the man (being a native American) who shall clip a fleece in the shortest time and best style, by clipping after the English fashion, five dollars.

* William Thornton (1762-1827) was an architect and physician who removed from Philadelphia where he was a member of the American Philosophical Society, to Washington and took part in planning and constructing the Capitol. He was the first commissioner of public buildings and in 1802 became Commissioner of Patents.

Manufactures:

For the national military dress, or uniform of Morgan's riflemen, with a complete statement of the expense accompanying the same, twenty dollars.

For the best five yards of cloth, yard wide, and composed of cotton and silk -- the silk to be derived from articles which have been worn out, as gloves, umbrellas, &c - fifteen dollars.

For the best blanket of common size, ten dollars.

For the best five yards of flannel, to be all wool, ten dollars.

For the best ball of wool-yarn, weighing one pound, which shall be spun to the greatest fineness on a wheel, to be ascertained by weighing any ten yards in the ball, five dollars.

To that family, in the county of Alexandria, who shall make it appear that they have made the greatest quantity of wearing apparel of domestic manufactures, and used the least of foreign importation, the largest prize fleece.

To that family, in said county, who shall prove that to a given number of female children, the most are good spinners, the next largest fleece.

To the cultivator of the soil, in said county, who shall prove that he has manured most land from his own resources, in the last twelve months, toll free at the Washington Mills for one year.

Washington, November 20, 1808.

After the premiums had been awarded at these festivals, Mr. Custis would invite his guests to partake of liberal cheer beneath the Washington marquee, and would then "call out" gentlemen from various sections of the Union, giving, as his own contribution to the 'feast of reason', interesting reminiscences of his childhood at Mount Vernon. He would always bring forward his project (which may be found in the National Intelligencer of November 24, 1810) of establishing a national agricultural organization, to be incorporated by the government, and attached to a national university. It was published in pamphlet form." (563)

Part II.

Development of a Definite Movement for Agricultural Education in the
United States, and some of the Agencies Contributing to this Movement -
1820 to 1860.

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DEVELOPMENT OF A DEFINITE MOVEMENT FOR AGRICULTURAL EDUCATION IN
THIS COUNTRY, AND SOME OF THE AGENCIES CONTRIBUTING TO THIS MOVEMENT -
PERIOD FROM 1820 to 1860.

INTRODUCTION.

In the period from about 1820 to 1860 great changes occurred in the political, social and economic life of the people of the United States. There was a wide movement of population to the fertile lands beyond the Eastern mountains and 20 new States were created. In this great region of virgin soil there was little difficulty in obtaining bountiful crops with the ordinary methods of agriculture. The settlers were therefore chiefly engrossed in solving the other problems of pioneer life and developing means of transportation. The building of roads, bridges and canals and then of railroads and telegraph lines was done on a large scale during this period, involving the work of great numbers of administrators, engineers, mechanics and laborers.

In both the old and new communities of the South agriculture, carried on largely with slave labor, was the predominant industry. After the invention of the gin, cotton growing rapidly developed and became much more extensive as the use of cotton fabrics at home and abroad was vastly increased through the development of water and steam power, invention of improved machinery, and organization of the factory system.

In the Northeastern States hostility toward England, which outlived the War of 1812, and obstructions to commerce growing out of European wars caused a great and rapid development of manufactures of many kinds. This first drew many of the enterprising youth from the farms to the factories and then led to a great increase of immigrants from foreign countries. Steamboats and railroads began to revolutionize transportation and finally the successful ocean steamship forecasted a wonderful development of international commerce. "Iron working, dyeing, and many other arts were being revolutionized by chemistry." "Prices,

which had been falling from the decline of the production of silver in Mexico, began to rise with the discovery and production of gold in California" near the close of this period. "This was the beginning of an era in the rise of prices and of material prosperity unexampled in the history of civilization." In the United States generally questions relating to the extension of slavery, to methods of transportation, to the establishment of new States and Territories, and to public systems of education largely absorbed the attention of the people.

Writing of the change of sentiment regarding agriculture at the beginning of this period Professor Babson of the Massachusetts Agricultural College says, "Just as the country was well started toward helpful discussions and improvements along agricultural lines the second war with England placed many hindrances in the way of further progress in this direction, and those hindrances were subsequently strengthened by the varied growth of manufacturing facilities and wealth-seeking industries. The tendencies of the times were cityward, and the era of good feeling naturally became an era unfavorable to great agricultural advancement. Nevertheless, the farmers and their friends, clearly understanding the unsatisfactory state of affairs, did what they could in spite of the indifference of the general public regarding their efforts." (575)

Growth of Agricultural Societies.

Local and county agricultural societies continued to be organized and spread over the country with the progress of settlement westward. In 1852 it was estimated that there were about 300 active organizations in the 31 States and 5 Territories and in 1860 there were 941 agricultural organizations recorded in the books of the United States Agricultural Society. The movement to establish State Societies proceeded slowly. The South Carolina Society organized at Charleston in 1785 functioned as a State Society for many years. The original

New York Society, begun in 1791, functioned for the State until it went out of existence. The Massachusetts Society, organized in 1792, has continued as a State society to the present time. The South Central Agricultural Society, formed in Georgia in 1846, was in a limited way a State society. In Kentucky a State agricultural society was formed in 1838 but came to an end in 1842. Another State society was organized in 1856. State societies were organized in New Hampshire and Michigan in 1849; in Pennsylvania and Wisconsin in 1851; in Connecticut in 1852.

The first State horticultural society was formed in New York in 1818. Pennsylvania followed in 1828, Massachusetts in 1829, New Jersey in 1838, Kentucky in 1840 and Delaware in 1847. Indiana undertook the organization of such a society in 1842 but it was short-lived. The Ohio Pomological Society began in 1847 and the Northwestern Fruit Growers' Association was organized in Illinois in 1851.

On December 15, 1841, "a meeting of the friends of agriculture from the different sections of the United States was held, pursuant to public notice, in the Hall of the House of Representatives," Washington, D. C. At this meeting the Agricultural Society of the United States was organized, having for its objects "to improve the condition of American husbandry and from its central position to serve as a medium of communication and of action with other agricultural societies throughout the Union." Among other things, the society was "to make efforts to obtain funds for the establishment of an agricultural school in the District of Columbia," with a course of public lectures on agriculture and the sciences, and an experimental farm." For this purpose the society made an unsuccessful attempt to secure the fund which was finally used for the establishment of the Smithsonian Institution. Commissioner Ellsworth took an active part in the formation and work of this society, the movement for which had been instituted under the leadership of Solon Robinson of Indiana. Though a number of men prominent in agricultural affairs took part in its organization the society did not receive substantial support and came to an end after the second meeting, held at Washington, May 4 and 5, 1842.

The agricultural societies became more democratic and brought a considerable and growing body of the most intelligent and progressive farmers into active relations with a nation-wide movement for the advancement of agriculture. Through meetings, fairs, correspondence, publications, and articles in the agricultural and other papers they sought to make the public feel that the interests of agriculture and farming people were entitled to more consideration by Congress and the State legislatures. They were increasingly active and influential in the efforts for establishing state boards of agriculture, a National department of agriculture, the teaching of agriculture in schools and colleges, the carrying on of experiments and scientific investigations for the improvement of agriculture and the building up of agricultural journals and books.

Early State Boards of Agriculture

New York

The first State Board of Agriculture was established in New York under a law passed April 7, 1819, but was not actually organized until Jan. 10, 1820. This law was largely due to the efforts of men connected with the New York Society for the Promotion of Useful Arts, whose active leader was Governor DeWitt Clinton (1769-1828). He was a nephew of the colonial governor, George Clinton, and a graduate of Columbia College in 1786. The next year he became a member of the New York legislature and thereafter had a long and distinguished career in political life, being mayor of New York, lieutenant-governor, governor in two periods covering 7 years, United States Senator for one year, and candidate for President of the United States. He was leader in the movement which resulted in the building of the Erie Canal and active in promoting free schools and measures for the advancement of literature, art and science. He was a member of the Society for the Promotion of Useful Arts (including agriculture), and from 1807 to 1813 was one of its board of "counsellors". He was thus in close association with Livingston, Van Rensselaer, Mitchill and the other most active members of this society. He was also on intimate terms with Elkanah Watson, (p. 108) partly because of their mutual interest in the development of waterways in New York. When Watson's effort in 1816 to get Congress to establish a national board of agriculture failed, he was ready for a movement to obtain a State board in New York. In connection with efforts to form county agricultural societies he obtained aid from Governor Clinton and considerable interest was awakened by the successful agricultural exhibitions in Otsego and Jefferson counties in 1817. How much this may have influenced Governor Clinton is not certainly known, though Watson states that "this excitement probably induced Governor Clinton, in January thereafter, to recommend in his inaugural speech the establishment of a State society, in connection with a board of agriculture and the consequent establishment of county societies throughout the State." (428)

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Reference to a board of agriculture was made by the Governor in his speech to the legislature, January 27, 1818, as follows:

"If not the exclusive duty, it is certainly the peculiar province of the state governments to superintend and advance the interests of agriculture. To this end, it is advisable to constitute a board, composed of the most experienced and best-informed agriculturists and to render it their duty to diffuse agricultural knowledge; to correspond with the country societies; to communicate to them beneficial discoveries and improvements; to introduce useful seeds, plants, trees and animals, implements of husbandry, and labor-saving machines; to explore the minerals of the country, and to publish periodically the most valuable observations and treatises on husbandry, horticulture and rural economy. The county societies ought to be enabled to distribute adequate premiums; and a professorship of agriculture connected with the board of attached to the university, might also be constituted, embracing the kindred sciences of chemistry and geology, mineralogy, botany and the other departments of natural history. By which means a complete course of agricultural education would be taught, developing the principles of the science, illustrating the practice of the art, and restoring this first and best pursuit of man to that intellectual rank which it ought to occupy in the scale of human estimation." (93)

A joint committee of both houses of the legislature was appointed to consider this portion of the Governor's message and decided "earnestly to recommend that a board of agriculture be established at the seat of government, to consist of a professor of agriculture and chemistry; and one member from each great district." Elkanah Watson had been "invited to attend their deliberations in the capitol" and his influence is shown in the language of the committee's report*, in which it is stated that if the legislature adopts their recommendations "means will be taken to organize county societies, so as to give a rapid excitement throughout the State, early in the spring, preparatory to a general display in October next. The board of agriculture will be the pivot on which the whole machinery should move." The opponents of this measure in the legislature raised the cry that its enactment would lead officials "to lord it over the farmers" and the bill was virtually killed by the passage of an amendment

* In the memoirs of Elkanah Watson by his son, Winslow C. Watson, it is stated (p. 395) in reference to the report that this production was chiefly from the pen of Mr. Watson. (429)

"that the farmers of this State be permitted to manage their own farms in their own way." However, the formation of county societies went on and in the fall of 1818 Governor Clinton, Van Rensselaer, Watson and other leading men of the State made a pilgrimage to attend some of their exhibitions. In this and other ways Governor Clinton was encouraged to make a second appeal to the legislature in his message in January, 1819, to establish a State board of agriculture and encourage the formation of agricultural societies.

Watson "devoted the whole of this second winter in contributing [his] utmost efforts to obtain a law" and near the end of the session the bill was passed April 7, 1819. This was "an act to improve the agriculture of this State" and appropriated \$10,000 per year for two years, "to be distributed among the several counties" as offset for money raised by the county agricultural societies to be used for premiums and reports on articles and productions deemed "best calculated to promote the agricultural and manufacturing interests of this State", provided that persons shall not receive premiums for agricultural products until they have delivered to the president of the county society "as accurate a description of the process used in cultivating the soil, and in raising the crop, or of feeding the animal, as may be, and shall, in all cases, describe the nature of the soil, the kind and quantity of the manure, the state thereof, and the time of year in which applied." The reports of the societies were to go to a board of agriculture, composed of "the several presidents of the several agricultural societies within the State, or a delegate to be chosen by each of the said societies."

This board may elect a president, secretary and other officers, select for publication such reports from the societies and "such other essays as they may judge advisable and shall annually publish a volume at the expense of the State" for distribution through the societies, the edition not to exceed 1500 copies. \$1,000 annually was appropriated to the board "to enable them to purchase and distribute among the several agricultural societies, such useful seeds as they may deem proper" and to defray other necessary expenses.

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At the organization of the board 26 counties were represented and Stephen Van Rensselaer was elected president, James LeRay de Chaumont, vice-president, Solomon Southwick, recording secretary and George W. Featherstonhaugh, corresponding secretary "to establish a correspondence with agricultural institutions" at home and abroad. A "general committee" was appointed to prepare and publish "an annual volume, with an index."

The general committee issued an address to the agricultural societies asking for their cooperation and that of "all intelligent persons", particularly the clergy, in collecting and diffusing useful information. To aid in this the committee presented 4 schedules of queries regarding crops, live stock, premiums, and the agricultural and other resources of each county.

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The first volume of the board, issued in 1821 contains "an essay on the principles and practice of rural economy" of over 300 pages, by Mr. Featherstonhaugh; "A geological survey of the county of Albany" by T. Romeyn Beck, under the direction of the county agricultural society; a letter from Sir John Sinclair, congratulating the board on its establishment; extracts from letters of George Washington to Sinclair; the address of former President Madison before the Albemarle, Va. Society, May 12, 1818; and the index called for by the law.

Volume 2 in 1823 and Volume 3 in 1826 contain articles on a great variety of agricultural subjects. The third volume closed the labors of the board, which ceased to exist by expiration of the law in April, 1825.

In the preface to this last volume the general committee points out some of the improvements in agriculture which the board and the societies have promoted and calls attention to the increasing application of chemistry and other sciences to agriculture and the organization of agricultural instruction in several schools in New England and New York. This volume also contains the report of the joint committee on agriculture of the New York legislature in 1825, in which the committee recommends "that a department of agriculture be established in the City of Albany

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to be conducted by an officer, to be denominated Secretary of the Department of Agriculture, to act under the direction of a board of agriculture to consist of 32 members of the legislature, governor, lieutenant-governor, heads of departments, and presidents of county agricultural societies, with honorary members without a vote, and that \$10,000 be appropriated for 10 years to the counties for premiums. The committee also expresses the opinion that eventually it will be "indispensable to establish an experimental farm in connection with an agricultural seminary."

The discontinuance of the Board of Agriculture gave rise to much discussion regarding what the State ought to do to promote agriculture. This came to a head in 1832 when an "agricultural State convention" was held at Albany, which resulted in the organization and incorporation of the New York State Agricultural Society. The distribution of state funds to the county societies was continued through this State society. There was, however, still some sentiment in favor of re-establishing the Board of Agriculture and in 1834 Governor Marcy in his message to the legislature, said that "a board, composed of practical farmers and men of scientific acquirements would possess great facilities for concentrating this varied and scattered information about agriculture; and the best means of disseminating it among the people would be afforded by a public institution, under the direction of such a board, where agriculture should be taught as a science and practically illustrated as an art." The committee on agriculture of the Senate, to which this portion of the governor's message was referred, reported adversely, claiming that the previous board had not accomplished anything of importance, and that moral evils had come from their meetings and exhibitions.

After an uncertain existence for about 9 years the State Society was re-organized in 1841 and an act was passed giving the Society functions much like those of the former Board of Agriculture. As in 1819 State funds were granted to the county societies for premiums. The State Society was also given funds for an annual "cattle show and fair". In 1893 a State Department of Agriculture

was organized out of a former Dairy Commission and took over the distribution of the county fair money. The State Society published reports and held fairs up to 1900 when a State Fair Commission was established. It continued as a nominal organization, whose president was a trustee of Cornell University, until 1910 when it was reorganized as a voluntary association for the discussion of agricultural questions. (326)

New Hampshire

The example of New York, was very soon followed in New Hampshire by the passage of an Act December 19, 1820, largely through the persistent efforts of Rev. Humphrey Moore of Milford. This provided that the presidents and one delegate from each agricultural society shall form the Board of Agriculture, which shall receive and examine reports from the county societies and publish these and other essays "relative to improvements in agriculture" at the expense of the State in a pamphlet with an edition not exceeding 1000 copies, to be distributed through the societies. It shall also examine the work of the societies and recommend alterations and improvements. An amendatory act of June 27, 1821, limited the board to one delegate from each county society. The legislature appropriated \$800 for the Board and the societies. The money for the Board was principally for the preparation and printing of the annual report. The Board was organized June 19, 1821 and held but few meetings before going out of existence. Its only report was issued in 1822, as the New Hampshire Agricultural Repository No. 1. (307)

Ohio

In Ohio an act was passed March 12, 1839, to encourage the establishment of agricultural societies by permitting the county auditors to grant them funds derived from the license fees paid for holding public shows under an act of February 28, 1831. On February 27, 1846, a broader "act for the encouragement of Agriculture" was passed. This repealed the act of 1839 but provided for a board of agriculture, as well as for aid to agricultural societies. ⁽⁴⁴⁵⁾ 53 persons from the several counties were named in the act to constitute a body corporate, with perpetual succession, entitled the "Ohio State Board of Agriculture". They were to determine by lot their terms of office, in such manner that the membership of one half of them would expire annually. They were to hold an annual meeting, together with the presidents and other delegates from the county agricultural societies, who were to fill vacancies in the board. The board was to receive annual reports from the societies, consider "the wants, prospects and conditions of the agricultural interests throughout the State" and make an annual report to the legislature of their proceedings, abstracts of the reports of the societies, a "general view of the condition of agriculture" in the State and recommendations with reference to its improvement.

When 30 or more persons in a county or district of two counties formed a society and raised not less than \$50 the county auditor was required to pay an equal amount to the society; not to exceed $\frac{1}{2}$ cent per inhabitant or \$200. To receive this bounty a society must make a report to the State Board of Agriculture. It must also offer annually premiums for improvements of soil, crops, manures, implements, live stock, articles of domestic industry, etc. and perform other acts to promote agriculture and household manufactures. The premiums must be arranged so that "small as well as large farmers" may compete and the profits accruing from improvements must be taken into account in making the awards. Competitors must file statements of the processes and profits connected with their improvements.

An amendatory act passed February 8, 1847 reduced the Board of Agriculture to 10 members and appropriated \$200 for its use. On the same day an "Act to create a permanent agricultural fund for the State of Ohio was passed, under which one half of the proceeds from permits for shows in the counties and the proceeds of sales of escheated lands were to be devoted to this purpose.

The Board was organized April 1, 1846 at Columbus and Allen Trimble was elected president. At one of its early meetings it urged the formation of township and neighborhood farmers' clubs, with libraries, discussions and lectures on agriculture. Persons "possessing requisite knowledge of science and agriculture" in different parts of the State are requested to lecture to farmers. At the joint meeting of the board and the county delegates a resolution was passed for attention by members of Congress from Ohio that there should be a Department of Agriculture at Washington supported from the Smithsonian funds. The first annual report contains abstracts of reports on agricultural conditions in 50 counties though there were societies in only about 20 counties. It was planned to hold the first State fair in 1849 but owing to an epidemic of cholera it was not held until 1850. The board was interested in agricultural science and published abstracts of Prof. Norton's analysis of the oat plant and Salisbury's analysis of the corn plant for the New York Agricultural Society. It also suggested that there should be an elementary treatise "on the application of science to agriculture, adapted to the use of common schools" and in 1849 pointed out that there was a quite general desire for a scientific agricultural survey of the State.

Massachusetts

In Massachusetts an Act of 1819 appropriated \$200 annually to each agricultural society raising \$1,000 and in like proportion up to \$3,000. Between 1803 and 1844 ten societies were formed. Through their influence in 1837 an agricultural survey act was passed under which a person was to be appointed "to collect accurate information of the State and condition of its agriculture and every subject connected with it, point out means of improvement and make a detailed report thereof", and \$2,500 was appropriated for this purpose. Henry Colman was appointed commissioner and made four reports containing a large amount of information. (227) These reports were widely circulated. The act was repealed in 1841 but the following year an act was passed which required the agricultural societies to make returns to the secretary of the Commonwealth in order to receive their State allowances and this was amended in 1845 to make their returns include "all reports of committees and all statements of experiments and cultivation" deemed worthy of publication, marking those passages most worthy of public notice. Under this law the Secretary of State annually published abstracts of these returns. In 1851 the societies (253) were exempted from taxation and in 1852 their funds invested in real estate were to be counted in determining their State allowances. Meanwhile there was somewhat active propaganda in favor of an agricultural college. Largely to promote this movement, in which he was deeply interested, Marshall P. Wilder at a meeting of the trustees of the Norfolk Agricultural Society Jan. 28, 1851, of which he was president, brought about the passage of a resolution that the president and secretaries of this society be a committee "to mature and adopt a plan for a convention of delegates from the various agricultural societies of the Commonwealth * * * to concert measures for their mutual advantage and for the promotion of the cause of agricultural education." (232) This convention was held at Boston, March 20, 1851, with Wilder as president. In his opening address he

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suggested a central committee of the societies to meet semi-annually and urged that the convention take action regarding agricultural education, for which, as well as for agriculture in general, both State and Nation ought to do more. The afternoon meeting of this convention was attended by "many of the leading agriculturists of the State". A "business committee" brought in a series of resolutions which were adopted. (232) These favored a central board of agriculture composed of delegates from the agricultural societies, agricultural schools publicly maintained and a state department of agriculture. The plans already made for an agricultural school should be profoundly considered by the people and the legislature. Proceeds of the sale of state lands should be devoted to agricultural education and agricultural societies should have a larger measure of protection and patronage from the legislature.

The convention voted for a central board consisting of 3 delegates from each incorporated agricultural society. (232) This body met September 3, 1851 and Wilder was elected president. At a second meeting January 14, 1852, it adopted a constitution and by-laws. Its objects were stated to be "the encouragement of agricultural education and the improvement of agriculture in all its departments" in this State. The committee on education presented a series of resolutions, in which the legislature is urged to establish a State department of agriculture and adopt "efficient measures for the professional education of farmers and the better development of the agricultural resources" of the State, with special reference to the plans for agricultural schools previously before the legislature and the expediency of using proceeds of the sales of State lands "for the promotion of agricultural science". These resolutions went over to a third meeting when they were adopted after extended discussion. A memorial accompanied the presentation of the resolutions to the legislature, February 4, 1852, in which there was further argument for a School for Agricultural Education. It also called attention to the bill before the previous legislature "providing for the creation of a board of agriculture analagous to the board of education."

In the first report of the official board of agriculture established in 1852 the work of this voluntary board is thus described: "This Board, although unaided by the State, carried on a series of extensive operations through the year, appointed committees to visit and report on all the exhibitions of the different agricultural societies and by its vigorous efforts aroused so great an interest in agricultural affairs, that at the session of 1852, the legislature was induced, with great unanimity to establish the (254) present board." ^ The transactions of the voluntary board, a document of 279 pages, was printed in connection with the transactions of the agricultural societies for 1851. (253)

On April 21, 1852, an act was passed to establish a State Board of Agriculture to consist of the Governor, lieutenant-governor, and secretary of state, ex-officio; one member from each agricultural society receiving State funds and 3 members appointed by the governor and council, for a term of 3 years. "It shall be the duty of this board to investigate all such subjects relating to improvement of agriculture in this Commonwealth, as they may think proper; and they are hereby empowered to take, hold in trust, and exercise control over any donations or bequests that may be made to them for promoting agricultural education or the general interests of husbandry." (254) They may appoint a secretary who shall take over the duties of the secretary of state relating to agricultural societies, and may receive a salary not exceeding \$1,500 to be fixed by the governor and council. "The board shall make an annual report, with such recommendations and suggestions as in their view the interests of agriculture may require." The board held its first meeting July 22, 1852. The members appointed by the governor were Edward Hitchcock of Amherst (president of Amherst College), Marshall P. Wilder of Dorchester and Nathaniel Wood of Fitchburg. The duties of the secretary were defined, including the following: To collect statistics, pamphlets and publications;

collect and preserve seeds and specimens and distribute new or approved varieties; collect and disseminate information regarding the best breeds of domestic animals and their management; investigate soils; discover and supply fertilizers; receive, preserve and report on approved agricultural implements; visit various agricultural districts of the State and deliver lectures on the practice and science of agriculture; attend the exhibitions of the agricultural societies, receive their returns and make abstracts of them for publication; and cooperate with the secretary of the board of education "for the introduction and study of agriculture and kindred branches in the educational system of the Commonwealth." The position was offered to President Hitchcock and when he declined, Amasa Walker, Secretary of State, was appointed secretary pro tem. At the third meeting, September 7, 1852, a committee was appointed to consider the expediency of preparing a manual on agriculture for the use of common schools; and another on the best means of promoting the interests of agriculture by public lectures. At the next meeting the second committee reported in favor of calling public attention to the importance of having lectures on agriculture in courses by lyceums and similar associations in rural districts. At the fifth meeting January 12, 1853 the first committee reported with reference to agricultural education "that studies of this description might be attended to with much benefit under competent teachers" and commended the manual entitled "The Progressive Farmer", by Prof. J. A. Nash, of Amherst College. At this meeting President Hitchcock read a paper in which he advocated the organization of "Farmers' Institutes" after the manner of Teachers' Institutes. (254)

American Agricultural Periodicals

Before the beginning of the 19th century agricultural subjects were often treated in newspapers or other journals of a general character. Examples of this practice were given by Carl R. Woodward, editor of the New Jersey State Agricultural College, in an address before the American Association of Agricultural College Editors July 8, 1925. The first issue of the New Jersey Gazette, established in 1776, stated that "Proposals for Improvements in Agriculture, and particularly in the Culture of Hemp and Flax, will be inserted with Pleasure and Alacrity." This resulted in the publication of agricultural articles from time to time. For example, in the issue of September 16, 1778, was "An essay upon the Manufacture of Indian Corn Stalks, for the Purpose of Making Molasses, Sugar and Spirits" and on December 13, 1780, a remedy for "Mad Staggers" of horses was described. The Rural Magazine, published weekly at Newark in 1798, was devoted to the publication of "a judicious selection of Essays on Religion, Morality, Agriculture and Miscellaneous subjects." The Newton Farmers' Journal, begun in 1797 at Newton, New Jersey, was probably a newspaper giving special attention to agricultural matters.

The Agricultural Museum, first published July 4, 1810, at Georgetown in the District of Columbia, was issued in the interest of the Columbian Agricultural Society, (127) but was essentially an agricultural journal since it was "designed to be a repository of valuable information to the farmer and manufacturer and the means of a free communication of sentiment, and general interchange of ideas on the important subjects of their occupations." (161) Each number was to contain 16 pages and the price of the 24 numbers to be issued annually was \$2.50. The first volume is complete but only eleven numbers of the second volume were issued and publication ceased in May 1812.

The American Farmer, established at Baltimore, Maryland, by John S. Skinner, April 2, 1819, was a much more substantial and successful journal. It was a weekly

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of eight quarto pages, costing \$4.00 per annum. The title described it as "containing original essays and selections on Rural Economy and Internal Improvements, with illustrative engravings and the prices current of country produce", and an editorial states that "The great aim, and the chief pride, of the American Farmer, will be to collect information from every source, on every branch of Husbandry, thus to enable the reader to study the various systems which experience has proved to be the best under given circumstances; and in short to put him in possession of that knowledge and skill in the exercise of his means, without which the best farm and the most ample materials will remain but as so much dead capital in the hands of their proprietor."

This paper continued until about 1862. Another journal by the same name was begun in 1866. The original American Farmer largely served as a model for the agricultural papers which succeeded it in different parts of the country. It covered a wide range of subjects through original articles and others compiled from a variety of sources, including agricultural papers in this country and abroad, proceedings of agricultural societies, etc. It was interested in agricultural experimentation and the education of the farming people through better common schools, manual labor schools, and the teaching of the natural sciences and agriculture in seminaries and colleges. The following examples from its first volume may serve to illustrate some features of this paper: A letter from Eli S. Davis of Abbeville, South Carolina, of October 13, 1819, favors the organization of agricultural societies in every county, to which should be attached men "with enough knowledge of chemistry to lecture at each meeting; if this is not practicable the works of Davy, Accum, Bachet and La Grange should be purchased for the use of members"; accounts are given of a meeting of the Agricultural Society of Maryland at Annapolis, at which there was an address by Dr. Joseph E. Meuse on Entomology; the proceedings of the Albemarle Society of Virginia; and the first general meeting of the United Agricultural Societies of Virginia in January 1820, with Edmund Ruffin as secretary, including their memorial to Congress protesting against a protective tariff. A Treatise on Agriculture taken from the Albany Argus is run as a serial and there is a letter from Dr. S. L. Mitchill to the Czar of Russia, transmitting a plow invented by Jethro Wood of Cayuga, New York.

On June 15, 1819 the first issue of The Plough Boy appeared at Albany, N. Y. The first New England Farmer began at Boston, Mass. in 1822; the first New York Farmer at New York City about 1827; and the Southern Agriculturist at Charleston, S. C. in 1828. The Genesee Farmer was established at Rochester, N. Y., January 1, 1831 and was united in 1839 with the Cultivator begun at Albany, N. Y. in 1834. This in turn was merged in 1866 with the Country Gentleman, which had begun as an independent paper in 1853. Among other papers begun in this period were the Maine (first called for a short time the Kennebec) Farmer, begun in 1833; the Farmers' Register in 1833; The Farmer's Cabinet in 1836; the Boston (afterwards American) Cultivator in 1839; the Massachusetts Ploughman in 1841; the Prairie Farmer (first the Union Agriculturist and Western Prairie Farmer founded by the Union Agricultural Society) at Chicago, in 1840; the American Agriculturist in 1842; Southern Cultivator in 1843; Southern Planter in 1841; The Indiana Farmer at Indianapolis in 1845 (edited for 2 years by Henry Ward Beecher), Valley Farmer (afterwards Colman's Rural World) in 1848; Northwestern Cultivator, Madison, Wis. in 1849; Valley Farmer, St. Louis, Mo. in 1850; California Farmer, San Francisco, Cal. in 1850; Rural New Yorker, Rochester, N. Y., 1850. In an address delivered in 1838 by Jesse Buel, editor of the Cultivator, it is stated that there were then nearly 20 agricultural papers, read probably by 100,000 farmers. The partial list compiled by Gilbert M. Tucker in 1909 shows 36 papers established up to the end of (106) 1850. ^ These papers had headquarters in 16 States, but 11 of them were published in the State of New York. In January 1837 the edition of the Cultivator had reached 18,000 and a list of the number of subscribers in the several States published by this paper that year showed that it was distributed in 27 States and the District of Columbia.

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The first horticultural journal was the Horticultural Register, begun January 1, 1835, at Boston, Mass. This continued for 4 years and was succeeded by Hovey's Magazine of Horticulture. In 1846 the Horticulturist was established at Albany, N. Y. These covered the whole field of horticulture; including pomology, floriculture and landscape gardening. Further specialization is seen in the Orchardist's Companion begun at Philadelphia in 1841.

Fessenden's Practical Farmer and Silk Manual appeared in 1835 at Boston, Mass. The American Silk Grower was begun in 1838 at Burlington, N. J.

This brief account of the early development of the agricultural press in this country will perhaps suffice to show that by 1850 this agency had already become quite important and made its influence felt throughout the United States. The agricultural papers of that day were not only diffusing a large amount of practical and useful information on a great variety of agricultural subjects but they were also setting before the farming people the advantages of the application of science to agriculture and the desirability of establishing institutions in which these sciences should be taught, along with theory and practice of agriculture. There was thus kept up a quite continuous agitation in the interests of agricultural education and experimentation, which broadly supplemented the efforts of agricultural societies and more or less influential individuals.

In this way the stage was being set for the more definite and finally successful effort to establish the agricultural colleges and experiment stations as well as national and state departments of agriculture. The agricultural press, as it grew in extent and influence, became more and more powerful as a medium for arousing the farming people to insist that their needs should be considered by legislative bodies and that measures should be adopted for the advancement of their interests through education and research, the collection and publication of statistics and other agricultural data, and the control of such things as fertilizers, injurious insects and plant and animal diseases.

Agricultural Books

The first distinctively American book on agriculture is commonly said to have been ⁶Essays Upon Field Husbandry, by Rev. Jared Eliot (1685-1783) of Connecticut, a graduate of Yale, which contained six essays originally printed separately and first brought together in an enlarged edition issued in Boston in 1760.

Rev. Samuel Deane of Massachusetts in 1790 published an encyclopedic work entitled New England Farmer, or Georgical Dictionary.

Essays and Notes on Husbandry and Rural Affairs, by John Beale Bordley of Maryland, was published in 1799 and with additions in 1801.

A treatise on Practical Farming, by John A. Binns, published at Frederick Town, Md., in 1803, contained accounts of his experiments with gypsum.

The Pennsylvania Farmer, by Job Roberts, published in Philadelphia in 1804 was "a selection from the most approved treatises on Husbandry interspersed with observations and experiments." It contained references to The Practical Farmer, by John Spurries of Brandywine Hundred, New Castle County, Delaware, published in 1793 and Gleanings on Husbandry, by James Humphreys, published in Philadelphia in 1803.

The earliest literature on horticulture was in the form of Kalenders which were inserted in Almanacs and then sometimes published separately. An example was the Gardener's Kalender, first published in an almanac at Charleston, S. C., in 1752. An American edition of Marshall's Introduction to the Knowledge and Practice of Gardening was published at Boston in 1799. The American Gardener, by John Gardiner and Daniel Hepburn, appeared at Washington, D. C., in 1804.

Arator, by John Taylor, was a collection of agricultural essays, originally published separately but brought together first in 1813 and published anonymously (512) "by a citizen of Virginia." A revised and enlarged edition with the author's name appeared in 1814 and was followed by several more editions, the sixth in 1818.

The Farmer's Assistant, by John Nicholson, esq., was published at Albany, N. Y., in 1814, "embracing every article relating to agriculture, arranged in alphabetical order."

Nugae Georgicae (Agricultural Trifles), by the Hon. William Johnson, senior vice-president of the Literary and Philosophical Society of Charleston, S. C., published in 1815, is an "endeavor to sketch the outlines of a picture of the cares and amusements, the duties and employments, of the Carolina farmer."

William Coxe of New Jersey, in 1817, published A View of the Cultivation of Fruit Trees, and The Management of Orchards and Cider, the first comprehensive American book on pomology.

In 1823 John Adlum, then resident near Georgetown, D. C., published A Memoir on the Cultivation of the Vine in America, and the Best Mode of Making Wine, followed by a book in 1826 entitled Adlum on Making Wine.

The Farmer's Library, by Leonard E. Lathrop, was published at Rochester, N. Y., 1826-1828 "to explain some of the fundamental principles which relate to agricultural science."

William Prince of New York, in 1828, published a Treatise on Horticulture.

Edmund Ruffin of Virginia, in 1832 (5th edition in 1852), published in book form his much enlarged Essay on Calcareous Manures, which had originally appeared as an article of seven pages in the American Farmer in 1821.

In 1835 in an article on agricultural books in the New England Farmer (v. 13, p. 402), it is stated that American books on this subject are few. Those listed are Deane's New England Farmer, Bordley's Husbandry, Taylor's Arator, Armstrong's Treatise on Agriculture, Nicholson's Farmer's Assistant, Lorrain's Husbandry, Ruffin's Essay on Calcareous Manures, and Fessenden's The Complete Farmer.

Andrew Jackson Downing of New York, in 1841, published a Treatise on the Theory and Practice of Landscape Gardening and Cottage Residences, and in 1845, Fruits and Fruit Trees in America.

In 1846 the first edition of a translation of Albert D. Thaer's Principles of Agriculture by William Shaw and Cuthbert W. Johnson was published in New York. A limited number of other agricultural books were published in this country during

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this period and foreign agricultural books, particularly those issued in England, were increasingly available in the United States.

Agricultural Text-Books

As soon as agriculture began to be taught in schools in the United States it was apparent that books adapted to school use in this country were required and efforts were made to supply this need. What was accomplished in this direction during the period now under consideration is very well brought out in L. H. Bailey's article on the "Development of the Text-book of Agriculture in North America", published in the Annual Report of the Office of Experiment Stations of the United States Department of Agriculture for 1903 and in revised form in the Cyclopedia of American Agriculture, (5) from which the following statements are taken:

1824. DANIEL ADAMS, M.D. The Agricultural Reader, Designed for the Use of Schools. Boston, Mass. 1824. Published by Richardson & Lord. 264 pages.

This book contains about seventy articles mostly on agricultural practice. There are a few poems; also a glossary. "The preface records that 'The design of a publication of this nature was formed as early as the year 1821; and it was a satisfaction, while in the prosecution of it, to perceive that the occasion for such a publication already begins to be felt.' This reference, as explained in a footnote, is to the report of a committee on crops of the Rockingham Agricultural Society and to the address of Theodore Sedgwick before the Berkshire Agricultural Society. Both these parties urged the necessity of a book on agriculture for schools."

1837. J. ORVILLE TAYLOR. The Farmer's School Book. Published at the "Common School Depository", Albany, N. Y.; and by Mack, Andrus & Woodruff, Ithaca, N. Y. 232 pages.

This is "designed as a reading book in common schools. Children may read and study in the schoolroom what they will practice when they become men. They now read the "English Reader" or some other collection that they do not understand or feel any interest in, and which, the worst of all, never gives them one useful idea for the practical business of life."

It begins with a general discussion of physical science, followed by consideration of farm practice and management of specific crops. The chapter on hemp was written by Henry Clay.

1839. JOHN ARMSTRONG. A Treatise on Agriculture: Comprising a Concise History of its Origin and Progress; the Present Condition of the Art Abroad and at Home, and the Theory and Practice of Husbandry. To which is added a Dissertation on the Kitchen and Fruit Garden. With notes by J. Buel. Harper & Bros. N. Y. 232 pages. No. 88 of "School District Library."

Apparently this was Judge Buel's adaptation of General Armstrong's treatise on agriculture which was first published as a serial in the Albany Argus, Judge Buel's paper, in 1819; and then published anonymously "by a practical farmer" in 1820 in Albany, N. Y. "This treats the subject almost wholly from the point of view of farm practice."

1842. ALONZO GRAY, A.M., Teacher of Chemistry and Natural History in Philips Academy, Andover, Mass. Elements of Scientific and Practical Agriculture, or the Application of Biology, Geology, and Chemistry to Agriculture and Horticulture. Intended as a Text-book for Farmers and Students in Agriculture. Allen, Morrill and Wardwell, Andover, Mass.; Dayton and Newman, New York. 1842. 368 pages. Later published by Van Nostrand & Terrett, New York.

This is apparently the first real American text-book on agriculture. It is quite technical, based on a discussion of the "vital principle", and deals especially with the biology and chemistry of that day.

1843. N. S. DAVIS, M.D. A Text-Book on Agriculture. Samuel S. & William Wood, New York. 187 pages. Illustrated with pictures of chemical apparatus and of insects.

This deals chiefly with chemical matters and contains little directly relating to farm practice. Insects injurious to vegetation are described in a long appendix.

1843. M. M. RODGERS, M. D. Scientific Agriculture, or the Elements of Chemistry, Geology, Botany, and Meteorology, Applied to Practical Agriculture. Illustrated by Numerous Engravings and a Copious Glossary. Erastus Darrow, Rochester, N. Y. 279 pages.

This deals quite completely and systematically with the sciences relating to agriculture, and closes with some discussion of agricultural subjects.

1843. L. BENTZ, Director of the Normal Primary School of the Meurthe, France, and A. J. Chretien, of Roville, Professor of Rural Economy in the same school. Elements of Agriculture, for the Use of Primary and Secondary Schools. Translated and adapted to the use of rural primary schools of the United States of America by F. G. Skinner. C. M. Saxton & Co., New York. Copyright 1843. 91 pages.

1850. JOHN P. NORTON, M.A., Professor of Scientific Agriculture in Yale College. Elements of Scientific Agriculture, or the Connection Between Science and the Art of Practical Farming. Prize essay of the New York State Agricultural Society. Adapted to the use of Schools. A. O. Moore, New York. Copyright 1850. 208 pages.

This treats the subject from the standpoint of agriculture and attempts to explain rural practices by the applications of science, particularly chemistry.

1851. REV. JOHN L. BLAKE, D.D. Lessons in Modern Farming, or Agriculture for Schools. Containing Scientific Exercises for Recitation and Elegant Extracts from Rural literature for Academic or Family Reading. Mark H. Newman & Co., New York. 432 pages. The cover stamp is "Agriculture for Schools".

This treats the subject from the literary side as is illustrated by the titles of some of the first articles -

Moral Dignity of American Labor, The Harbinger of Spring, the Old Grist-mill (poem), Thanksgiving Day (poem), Scientific Terms in Agriculture, Agricultural Chemistry, The Crop of Acorns (poem), The American Ploughman, Physiological Reflections on Water, The Superiority of Educated Labor.

1854. J. A. NASH, Principal of Mount Pleasant Institute, Instructor of Agriculture in Amherst College, and Member of the Massachusetts Board of Agriculture. The Progressive Farmer: A Scientific Treatise on Agricultural Chemistry and the Geology of Agriculture. On Plants, Animals, Manures, and Soils. Applied to Practical Agriculture. Copyright, 1852. Reprinted in 1857 by A. O. Moore, New York. 254 pages.

This deals especially with chemistry as related to agriculture and with the use of fertilizers.

1854. GEORGE E. WARING, Jr., Consulting Agriculturist. The Elements of Agriculture: A Book for Young Farmers. With Questions Prepared for the Use of Schools. Clark & Maynard, New York. Copyright 1854. 288 pages.

This is written quite completely from the chemical point of view.

1854. CHARLES FOX, Lecturer on Agriculture in the University of Michigan. The American Text-Book of Practical and Scientific Agriculture, Intended for the Use of Colleges, Schools, and Private Students, as well as for the Practical Farmer. Including Analyses by the Most Eminent Chemists. Elwood & Co., Detroit, Mich. 354 pages.

This deals quite fully with methods of growing the principal crops.

1859. J. L. CAMPBELL, A. M., Professor of Physical Science, Washington College, Va. A Manual of Scientific and Practical Agriculture for the School and the Farm, with Numerous Illustrations. Lindsay & Blakiston, Philadelphia. 442 pages.

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School Libraries

In 1835 New York passed a law permitting any school district to levy a tax of \$20 for a school library and \$10 annually for its maintenance. When this did not have any important result the State made a permanent appropriation of \$55,000 annually for libraries in every school district but after three years the money might be spent for books or teachers' wages. These libraries were intended for the use of people generally, as well as of students in the schools.

Massachusetts, under the influence of Horace Mann, followed New York with a permissive law in 1835 and in 1842 gave \$15 to each district contributing an equal amount. Eleven other Northern and Western States passed laws encouraging school libraries prior to 1860. A publication of the Smithsonian Institution in 1851 reported 9505 public school libraries in the United States with over 1,500,000 books, of which over 1,300,000 were in New York State. Books on agricultural and related subjects were often found in these libraries. The general results of this movement were, however, disappointing. The lack of supervision in the selection, care and use of books and in the rural schools the frequent changes of teachers made these libraries weak in contents and of little educational value. Often the books were soon dispersed or destroyed.

General Educational Progress

With the growth of population in the United States and its rapid spread westward during this period the number of elementary and secondary schools and colleges greatly increased. There were, however, no fixed standards for these institutions and consequently great variety in the work which they actually undertook. In considering any particular school it is therefore necessary to get behind its name. This is especially true with reference to seminaries, academies, and colleges. The support of primary schools with public funds became quite general. In the North these followed largely the New England pattern with local control in small districts and were patronized by the people generally, while in the South the county was the

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unit of organization and the notion that the public schools were charity organizations largely prevailed and greatly restricted the attendance.

For the most part the instruction was limited to the three R's, with the use of very few textbooks and no illustrative material. There were, however, some efforts to interest pupils in natural objects and to supply them with simple apparatus, illustrated texts and other reading material.

During this period there was a beginning of special training for teachers and the establishment of normal schools. Many of the teachers in the elementary schools were men, particularly students from academies and colleges, who took this way of getting money to continue their education.

Above the common schools were two types of secondary schools - (1) those confined to preparing students for colleges, often called grammar or Latin schools, and (2) the academies or seminaries. Most of the secondary schools were maintained with the tuition paid by the students, a few were endowed and some were supported in whole or in part by public funds, or grants of land.

In the North the New England examples of secondary schools publicly supported were more and more followed, particularly in the newer communities but elsewhere it was difficult to overcome the tradition that private funds should support secondary education.

In the grammar schools instruction was quite strictly confined to the Latin, Greek and mathematics required for entrance to college. These schools had so little relation to the educational needs of the people generally that it became increasingly difficult to maintain them with public funds on this narrow basis. Even in Massachusetts the original provision for a grammar school in each town of 100 families was modified by subsequent legislation until in 1824 towns of less than 5000 inhabitants were relieved from obligation to maintain such schools. At that time there were only 7 towns which under this new law were required to maintain such schools. Meanwhile the more liberally organized academies, encouraged

unit of organization and the notion that the schools were small.

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by grants of State lands, increased in number until by 1840 there were more than 50 in this State.

The Academies

In New York academies were developed under the general supervision of the Regents of the University of the State of New York and a number of them received grants of land and money.

Pennsylvania gave financial aid until 1843 when there were 64 academies and 37 female seminaries. Maryland and Louisiana gave State aid to a limited number of academies. They were also developed in Kentucky, Tennessee, Indiana and Illinois and as far South as Florida, where in 1840 there were 18 academies and grammar schools.

In Michigan besides academies of the ordinary type, nine branches of the State University were established as preparatory schools under the University Act of 1837 but were discontinued in 1849.

The preparatory departments in colleges were often called academies, particularly in the South and West.

The high schools as a part of a city system of public education began in Boston in 1821 with the establishment of the English Classical School, which from 1824 was called the English High School. Similar schools were established in Philadelphia, Pa. in 1838, Baltimore, Md. and Charleston, S. C. in 1839, ^{Middletown, Conn. in 184} Providence, R. I. in 1843 and New York City in 1848. They existed in 80 cities by 1851 and in 1852 there were 64 in Massachusetts alone. The term Free Academy was sometimes applied to these schools. Secondary schools in general were also designated academies. An example of this is seen in the educational statistics for 1850 published in the first volume (1856) of Barnard's American Journal of Education where it is stated that there were 6,085 academies with 263,096 students in the United States.

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The Academies

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The earlier academies were not primarily preparatory schools. Many of their students entered college, but the academies introduced courses intended for other purposes. Sometimes these involved subjects not given in the colleges at that time; sometimes subjects were taken from the college courses and the instruction rose to above the ordinary secondary grade.

The academies gave particular, though often superficial, attention to the rapidly developing natural sciences, such as astronomy, natural philosophy (including electricity, magnetism and other branches of physics), chemistry, botany, and geography. In English and mathematics some of the academies gave more liberal courses than most of the colleges. They often had classes for teacher-training and paved the way for the normal schools. Some of them were coeducational or they led to the establishment of separate schools for girls. In general they were the popular schools of their time and the colleges themselves began to feel their liberalizing influence. For example, Timothy Dwight, who had been a teacher in the Academy at Greenfield, Conn. when he became president of Yale College brought in Benjamin Silliman and started the movement which resulted in the Sheffield Scientific School.

The Lyceums

Among the factors which broadened the educational outlook of the people and laid the foundation for vocational education was the Lyceum movement. This was originated in 1826 by Josiah Holbrook (1788-1854), brought up on a farm at Derby, Conn., graduated at Yale in 1810 and later on an attendant at lectures there by Professor Silliman. ⁽¹⁴³⁻¹⁴⁴⁾ In 1819 he began an industrial school on Fellenberg's plan ^(p. 176) and in 1824 undertook an agricultural school at Derby. [^] When this failed through lack of sufficient financial support, he began a propaganda for the more general diffusion of education among adults and children. This was to be done through the organization of associations of adults (1) "to procure for youths an economical

and practical education and to diffuse rational and useful information through the community generally and (2) to apply the sciences and the various branches of education to the domestic and useful arts and to all the common purposes of life." (142)

The societies were to have meetings, institute regular courses by lectures or otherwise, procure books, apparatus and collections and aid in establishing institutions for a thorough education and "in application of the sciences to agriculture and the other useful arts and for qualifying teachers."

In November, 1826, he organized the Millbury (Mass.) Lyceum as No. 1 Branch of the American Lyceum. Other branches were soon formed and combined into the Worcester County Lyceum. The same thing was next done in Windham County, Connecticut. A State association was formed in 1830 in Massachusetts and the American Lyceum Association was organized in 1831 at a meeting in New York City at which Stephen Van Rensselaer presided and 7 States were represented. These meetings continued annually until 1839, when the Society secured a convention called by State governors at which the formation of State boards of education with secretaries as State superintendents was urged.

The Society endeavored to improve school legislation, the training of teachers, equipment of schools with books, apparatus and teaching appliances, the methods of teaching and school discipline and to promote introduction of natural sciences into schools and interest in the education of girls and women. In 1831 about 900 towns had lyceums and for the next 20 years most public lectures were delivered before such organizations. These covered a wide range of subjects and the lecturers were often very distinguished men in literature, science and political affairs. For example, Professor Silliman, Wendell Phillips, and Henry Ward Beecher often appeared on lyceum platforms. The movement also led to the establishment of many local libraries.

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of the societies was held in New York in 1831 at a meeting in New York
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societies continued annually until 1839, when the society secured a permanent
home in the city of New York at which the formation of state society of education
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teachers, equipment of schools with books, apparatus and teaching appliances,
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promoted the education of the colored people and to promote instruction of native
and foreign students in the education of art and science. These covered a wide range of subjects and the
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On his own account Holbrook opened an educational exchange for school apparatus, collection of natural objects, etc., in 1826 and in 1830 began to issue Scientific Tracts for teachers and advanced students. He was a frequent lecturer at teachers' institutes in Massachusetts under Horace Mann and in Connecticut under Henry Barnard.

American Institute of Instruction
(320)

In 1830 the American Institute of Instruction, ^ the oldest educational association in the United States, was organized by "teachers and friends of education" at Boston, Mass., and held its first regular meeting in August of that year. This was attended by 300 delegates from 11 States. "The Institute took a leading part in most of the great educational movements of the country during the formative period of the State school systems" and "some of the most important contributions to the literature of American education were given originally as lectures at the Institute", and published in its proceedings. Its membership, however, has been almost entirely confined to New England and 49 of its first 50 annual meetings were held there.

Horace Mann and the Educational Revival

In 1837 Horace Mann (1796-1859) in Massachusetts began what has often been called the great educational revival. ^ (237) Alarmed by the generally weak condition of the district schools, owing largely to the ignorance and prejudices of the local boards controlling them, he undertook to arouse public sentiment for a more efficient system of public education, with special reference to the common schools. As a member of the legislature he secured the passage of an act creating a State board of education and became its first secretary. He enlisted the aid of popular speakers and through the lyceums held hundreds of public meetings throughout the State. This led to the further important legislation for the betterment of the school system. He organized teachers' institutes, using the best available instructors

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and beginning in 1838 brought about the establishment of three normal schools for which the State soon assumed full responsibility. For 12 years he published elaborate reports on the educational situation at home and abroad and measures for the improvement of the schools. In 1838 he established the Common School Journal and later used Barnard's American Journal of Education as a medium for his discussion of educational subjects.

In these and other ways he aroused great interest in popular education far beyond the borders of Massachusetts. His efforts and those of his followers produced considerable improvement in the public schools though he was not able to break down local control of the schools in small districts or to secure trained superintendents, particularly for the rural schools.

The Broadening of the College Curriculum

During the eighteenth century and the early years of the nineteenth century instruction in the natural sciences had been gradually introduced in a number of American colleges. Reference has already been made to the beginnings of such instruction at the University of Pennsylvania and Columbia College. A department of mathematics and natural philosophy was established at Harvard College in 1727 and a professorship of natural history in 1804. A chair of chemistry was provided at Princeton in 1795. Instruction in physics and chemistry was given at Dartmouth College and in physics at Union College before 1800. At Yale College Benjamin Silliman was elected professor of chemistry, geology and mineralogy in 1801. Williams, Bowdoin, William and Mary, Dickinson and Hobart Colleges and the Universities of Georgia, North Carolina and South Carolina were among the institutions giving instruction in some branches of natural science prior to 1820. The early instruction was mainly by lectures, supplemented to a limited extent by the exhibition of specimens or by demonstrations conducted by the teachers. Princeton had a chemical laboratory about 1800, Williams College fitted one up in 1812 and Harvard provided one a little later. The Rensselaer Institute established at Troy, N. Y. in 1824 had wide influence

~~1881~~

on the teaching of natural sciences by observational and experimental methods. On account of its early relations to agricultural education further reference to this school is made later on. (p186)

The constant growth of the natural sciences, the development of the literature in the various modern languages, and the accumulation of knowledge in other branches, as well as the contact of American students in larger numbers with foreign institutions of higher learning, particularly in Germany, led to the widening of the curriculum in leading American colleges, introduction of a number of elective studies and an increase in the number of professorships in the newer subjects.

Such institutions as Harvard, Yale, Columbia, Princeton, Dartmouth, Bowdoin, and Amherst College felt and yielded to these influences to a greater or less extent. The University of Virginia, opened in 1825, had its curriculum arranged in 10 groups: (1) Ancient languages (2) modern languages (including Anglo-Saxon), (3) mathematics (including architecture), (4) physics-mathematics (including astronomy), (5) physics, chemistry and mineralogy, (6) botany and zoology, (7) anatomy and medicine, (8) government (history being interwoven with politics and law), (9) municipal law, (10) ideology (including ethics, rhetoric and fine arts).

This curriculum was administered under a virtually complete elective system.

About this time under the influence of Jefferson and of the University of Göttingen, where he had studied, George Ticknor developed the department of modern languages at Harvard College and attempted to introduce a kind of elective system in that college.

At his instance a committee in 1824 recommended the division of the college into departments and the organization of two groups of studies, those necessary for a degree and those taken by students wishing "to pursue particular studies to qualify them for scientific and mechanical employment and the active business of life." There was much opposition to this plan but in 1825 departments were created

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and a resolution was adopted "that the university is open to persons who are not candidates for a degree and desire to study in particular departments only."

Little result came from this except the admission of some special students in the department of modern languages.

Again in 1841 it was proposed that the prescribed curriculum should end with freshman year after which there should be a choice of natural history, civil history, chemistry, geography, astronomy, modern languages, and modern oriental literatures, but this failed, and in 1846 a program was adopted which only allowed juniors to elect three of the following studies: Greek, Latin, mathematics, German and Spanish, to which Italian was added in Senior year.

In 1847 Lawrence Scientific School was organized in connection with Harvard College for those students who desired a scientific and technical course.

Henry W. Longfellow, who was to succeed Ticknor at Harvard, was made instructor in modern languages at Bowdoin College in 1829. The Visiting Committee at Bowdoin inquired "whether the course of instruction ought not to be more of a practical and less of a scholastic character, and to this end whether the study of Greek ought not to be optional with the student."

Amherst College in 1826 announced a Science Course in which French and Spanish were substituted for Latin and Greek. There was also to be a department devoted to the science and art of teaching and a department of theoretical and practical "mechanism".

Yale College under the presidency of Timothy Dwight began in 1802 the development of instruction in the natural sciences, which led to the establishment of the Scientific School as a separate branch of the University. (See p.247)

In 1842 Francis Wayland, President of Brown University, criticized the American system of collegiate education and proposed material changes in his book entitled "Thoughts on the present collegiate system in the United States." (476)

This led to wide discussion of the whole subject of college education. He pointed out that as new branches were introduced in the colleges and the whole course was prescribed the student gained only a superficial knowledge of the subjects included in the curriculum and the value of college education was thereby greatly weakened. He recommended an enlargement of the requirements for admission to college and either the limiting of the college course to a few studies or extending the time given to it, or making the college "more nearly resemble a real university, that is, to make it a place of education in all the most important branches of human learning." Some of these might be selected for the curriculum leading to the degree of bachelor of arts and others for bachelor of science or literature. To get the degree of Master of Arts a student might be required to pursue the studies for both the bachelor degrees. The college should not only offer courses leading to the professions but there should be established courses of lectures on the sciences and their applications to the arts and on other subjects "to which men of all classes may resort".

As president of Brown University he introduced an elective system, established a three-year course for the bachelor's degree, encouraged graduate study and research, and made the sciences prominent in the curriculum.

As the teaching of the natural sciences in colleges and schools developed the need of text-books, apparatus and illustrative material became apparent. Teaching by lectures was common but as text-books became more numerous they were more largely used in both colleges and secondary schools. Science instruction then became more and more a mere matter of memorizing and recitation. A few teachers, however, introduced so-called experiments, that is, demonstrations performed in the presence of the students. The actual handling and study of specimens by students, even in the descriptive sciences, was a rare thing. At a few places botanical gardens gave students of botany some opportunity to observe a considerable number of species and small herbaria were sometimes collected by students as a part of the required work in botany.

This kind of botanical work was greatly stimulated by the publications of Asa Gray (1810-1888) who in 1836 became curator of the New York Lyceum of Natural History and that year published the first of his text-books, entitled "Elements of Botany". As Fisher professor of natural history at Harvard College from 1842 he exerted for many years through his students and his books a very wide influence on the teaching of botany in this country. The first edition of his Manual of Botany appeared in 1848.

The Sillimans, father and son, at Yale College, were very influential in extending and improving the teaching of chemistry and geology and as we shall see later laid the foundation for the teaching of agricultural chemistry and agriculture at that institution.

James Dwight Dana (1813-1895) a student at Yale under the elder Silliman and assistant to him for a number of years from 1830, devoted himself especially to mineralogy and geology and was the author of several widely used text-books on those sciences. Among his works were "The Elements of Mineralogy" published in 1837 and "Textbook of Geology" in 1864. He was professor of natural history at Yale from 1855 to 1890 and editor of the American Journal of Science for many years from 1846.

An event of very great importance in the history of science teaching in this country was the coming of Louis Agassiz to Boston in 1846 to deliver a course of popular lectures at the Lowell Institute. (218) This organization had been established in 1839 as the result of a bequest by John Lowell Jr. for "the maintenance and support of public lectures, to be delivered at Boston, upon philosophy, natural history, the arts and sciences, or any of them". The course given by Agassiz was so well received and made such a wide impression that the authorities of Harvard College were led to establish the Lawrence Scientific School in 1847 and make him professor of zoology and geology in this new institution. He was born

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at Motier in Switzerland and from childhood had bent toward the study of nature, particularly in the field of zoology. He studied medicine and natural history at Zurich, Heidelberg and Munich. After graduating in medicine and taking a degree in philosophy (1830) he studied at Paris under Cuvier and then was professor of natural history at Neuchatel (1832-46), spending his summers in studying glaciers in the Alps. In this country he traveled extensively, going as far west as California and south to Florida, and delivered many lectures on scientific subjects in various places. In this way and through his writings, including text-books on physiology and natural history and on methods of teaching natural history, he gave a great impetus to the movement for incorporating science more broadly in the curricula of colleges and secondary schools. He also helped greatly to infuse life into science teaching by his insistence on actual participation of the students in the examination and handling of the objects of scientific study.

Agassiz was for several years a member of the Massachusetts State Board of Agriculture and had a direct connection with the movement for agricultural education, particularly in his relation to the establishment of the Massachusetts Agricultural College.

Manual Labor Schools (See also p. 13)

A movement which had a more direct relation to the early efforts to establish agricultural schools in this country was that which grew out of the influence of the teachings and work of Fellenberg in his schools at Hofwyl, Switzerland. (43) Information regarding the considerable success of his enterprises was brought to our people by American visitors to Hofwyl, in publications issued at home and abroad, and in other ways. Certain features of Fellenberg's theories and activities fitted into educational and financial conditions here in the first half of the 19th century and excited so much interest that widespread efforts were made to conduct schools based at least in part on his ideas.

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It was difficult to finance educational enterprises and many students greatly needed some way of earning money to pay school expenses. It was hoped that by the manual labor of both teachers and students on farms and in workshops connected with the schools ~~that~~ the management of educational enterprises would be relatively inexpensive if not wholly self-supporting, and that many students would be able to earn at least their tuition and board while attending school. The rigid and monotonous life prevailing in boarding schools and colleges, with comparatively little opportunity for physical exercise, seems to have made students of that day as a class so relatively pale, feeble and dyspeptic that the Fellenberg system was hailed as a means of improving their health and vigor. There was also the plausible theory that manual labor systematically pursued under intelligent direction and associated with intellectual pursuits had a definite educational value, besides inculcating thrift and strengthening moral stamina.

It is true that from even the latter years of the 18th century there were sporadic attempts to combine manual labor, particularly on the farm, with school education, as in Judge Phillips' plan for the academy at Andover, Mass., at Cokesbury College at Abington, Maryland, and the De La Howe School at Lethe, South Carolina; but these had little, if any, relation to the definite movement now being considered. At Cokesbury College the students combined practical farm work and gardening with the reading of Vergil's Georgics.

Manual labor schools were in operation in Connecticut in 1819, in Maine in 1821, in Massachusetts in 1824, in New York in 1827, in New Jersey in 1830, and about the same time in North Carolina, Ohio and Florida.

A school organized near Pendleton, South Carolina, about 1830, apparently illustrated the reform element in Fellenberg's plan, since it had as students "75 of the worst boys in South Carolina". A manual labor academy was established at Germantown, Pa. in 1830 by George Junkin, afterwards the first president of Lafayette College.

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In 1829 a Department of Manual Labor was established at Waterville College, Maine. The first shop was built in 1830. In January 1831 a superintendent came and operations began. Another building was soon put up by the labor of students, who worked three hours a day. They also made doors, bedsteads, tables, boxes, etc. Division of labor was practiced. A printing shop was established in 1835. The students afterwards put up other buildings. However, the Department did not pay and was abandoned in 1842. The manufactures were poor and there was no ready market.

There were also manual labor departments at Oberlin College in Ohio and some other colleges.

In Georgia a Baptist convention in 1831 determined to establish a school which would "unite agricultural labor with study" and this was opened in 1833 as Mercer Institute. The manual labor plan was abandoned in 1844.

The New York Farmer in 1833 stated that at the agricultural fair at Pawtuxet, Rhode Island, premiums were given for crops to students of a manual labor school, which at that time had 92 students.

Several religious denominations undertook to combine manual labor in fields and shops with literary branches for students in theological schools, "partly with a view to defraying a portion of the expense of their education, and partly with the thought that they might thus be brought into touch with actualities."

In 1831 an attempt was made to promote manual labor in literary institutions on a broader scale by the creation of "The Manual Labor Society" in New York. This was to influence existing institutions by convincing them that manual labor could be made a part of their curriculum without lowering the standard of literary and scientific work. It was also to promote the establishment of new schools. Theodore F. Weld, who had been connected with the Oneida Manual Labor Institute at Whitesboro, New York, was made the field agent of this society. He visited a number of States and issued a report. Opposition to the literary institutions and difficulties in

exciting sufficient interest in its work caused the failure of the Society. It was, however, active in promoting gymnastics in schools and left its most permanent impress in this direction.

The school at Whitesboro, which was in operation between 1827 and 1834, may serve as a good example of the manual labor school of this period. The students worked three hours a day at farming, horticulture and mechanic arts and the rest of the day was given to classroom work in the English branches. "By the practice of early rising more than the usual hours were devoted to study." Through the labor of the students it was aimed to make the school largely self-supporting.

According to an announcement of the school in 1831 it "began with six scholars only, but soon increased to sixty, more than which number cannot be accommodated." The popularity of the school at that time was shown by the fact that "although pains had been taken to make known that the institution was filled, five hundred applicants, it is said, were necessarily rejected last year, and more than fifty during the first three months of the present year."

In 1847 a manual labor school was opened in Lenawee County, Michigan, between Adrian and Tecumseh, by the Society of Friends (Quakers). It had a farm of 400 acres on which it was expected that the students would work and earn a part of all of their expenses. "The girls did much of the housework, the boys cut wood and did some work in garden and field. No one especially qualified was employed to teach the students in this work. The plan gradually fell into discredit and most of the farm was sold. The school was later for many years called The Raisin Valley (271) Seminary." ^ This school has a special interest in connection with the history of agricultural education because Dr. W. J. Beal, for many years professor of botany at the Michigan Agricultural College and author of a history of the college, "was a student in this school during its organization and for several years later."

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Agricultural Schools and Academies

Along with the manual labor schools in which agricultural operations were conducted simply as a means of physical exercise and a source of income to the school or the students, there were developed institutions in which instruction in the application of the natural sciences to agriculture or in the theory and practice of agriculture itself was combined with practical work in fields and shops and instruction in various academic branches usually taught in secondary schools. These institutions, which are conveniently classed as agricultural schools, varied greatly in the amount and character of the instruction relating to agriculture, their farm equipment, the ages and previous training of their students, and the general educational grade. In general their agricultural instruction was superficial and temporary. They are therefore chiefly interesting as showing a more or less earnest purpose to give agriculture a pedagogical status by uniting theory with practice in the school curriculum and to satisfy the demand of a considerable number of the more intelligent farming people of that day that in some way agriculture should reap the benefit of advancing knowledge regarding the phenomena and laws of nature. They were premature developments because there was not yet a body of knowledge relating to agriculture which could be successfully used in secondary schools. As experimental ventures in education they served, however, to stimulate the movement which was to result in the establishment of agricultural colleges and experiment stations.

The Gardiner Lyceum (Maine)

The Gardiner Lyceum was established at Gardiner, Maine, in 1821 and incorporated (203) the following year. ^ Its founder was Robert Hallowell Gardiner (1782-1864), a graduate of Harvard College in 1801, who inherited a tract of land "six miles on the Kennebec River and running eleven miles back". He resided on this estate more than 60 years and was prominent in the business, political, educational and religious life of the State. "Though not himself a practical farmer, he took a deep interest in promoting

agriculture, fostering agricultural societies and seeking to make the farm which he reserved for his home a model, by introducing superior breeds of animals, improved machinery, and valuable fruits and grains."

Under his leadership the school was organized and a petition for its incorporation was addressed to the Maine legislature, stating "that a donation had been offered of land lying on the Kennebec River, in the town of Gardiner, estimated at \$4,000, for the purpose of establishing within said town a school for teaching mathematics, mechanics, navigation and those branches of natural philosophy and chemistry which are calculated to make scientific farmers and skillful mechanics." To give the institution more than a local status the board of visitors appointed under an act of February, 1823, were the governor, the president of the Senate, the speaker of the House of Representatives, the presidents of Bowdoin and Waterville Colleges, and nine other men from different parts of the State, including Benjamin Vaughan of Hallowell. (211) A substantial stone building was erected and the school was opened January 1, 1823. The first principal was Rev. Benjamin Hale, afterwards a professor in Dartmouth College and then president of what is now Hobart College. His immediate successor was John H. Lathrop, later a professor in Hamilton College and then president of the State Universities of Missouri, Maryland and Wisconsin, who was followed by E. L. Cushing, (211) afterwards supreme judge in New Hampshire, and Ezekiel Holmes. (1801-1865) a native of Massachusetts, and graduate of Brown University, and the medical department of Bowdoin College, as a student was especially interested in botany and mineralogy. In later life he became more widely versed in the natural sciences of his time, including geology, zoology, entomology and chemistry, and the application of these sciences to agriculture. In 1825 he settled at Gardiner, Maine, intending to practice medicine but was led to accept the position of "permanent instructor in agriculture" in the Lyceum. "He gave lectures on agriculture before what was called a Special Class in Agriculture, had charge of the farm, which was operated

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by him, and on which the records show he agreed to employ 12 students during one summer; he was also steward." In 1826 he became professor of agriculture and natural history. In 1832 he moved to Winthrop, Maine, and for several years was a lecturer in Waterville College. During 1828 he edited a temporary monthly paper called The New England Farmer's and Mechanic's Journal and from 1833 to 1865 he was editor of the Maine Farmer. He proposed a State Board of Agriculture in 1840 and after its establishment in 1852 was its first secretary for three years. Largely through his efforts the State agricultural society was established in 1855 and he was its secretary until his death. He was several times a member of the legislature, serving in both houses, and twice a candidate for governor. Just before his death he persuaded the legislature to establish the State College of Agriculture and Mechanic Arts under the land-grant act of 1862, as a separate institution and one of the principal buildings of that institution, now the University of Maine, bears his name.

It will thus be seen that the men who shaped the policies and work of the Gardiner Lyceum were strong and well-trained men. In 1823 the legislature gave the school \$2,000 and from 1825 for six years \$1,000 annually. The school began with 20 students. In 1824 it had 53 and in 1825 there were 120, but in 1826 the number fell to 55, of whom only 2 were natives of Gardiner. It continued thereafter with varying success until 1832, when it closed owing to the financial embarrassment of Mr. Gardiner and to other causes.

When the professorship of agriculture was established in 1824 its objects, as stated by the trustees, were (1) "to give the future agriculturist the knowledge of those principles of science upon which his future success depends and to let him see them reduced to practice" and (2) "to furnish a beneficial employment as recreation and to try a series of agricultural experiments adapted to the soil of Maine."

Agricultural Seminary at Derby, Conn.

The Agricultural Seminary at Derby, Conn., founded by Josiah Holbrook on his own farm with the assistance of Trueman Coe, a teacher, in the spring of 1824, continued only about a year. The following statement about this school was made by Trueman Coe to a son of Mr. Holbrook:

"He (Josiah Holbrook) had long cherished the idea of endeavoring to found an institution in which the course of instruction should be plain and practical; an agricultural school where the science of chemistry, and mechanics, and land-surveying should be thoroughly drilled into the mind of the pupils by practice. With these views the Agricultural Seminary was commenced in Derby in 1824, and continued to the fall of 1825 under the direction of your father and myself, and as far as I know, was the first educational movement of the kind in all that region. But the institution, being unendowed and on a private footing, labored under many embarrassments, especially in never having land enough to accomplish the ends of its founders. We did what we could to train the students in the analysis of soils, in the application of the mechanical powers to all farming operations, and took out our young men often into the field and country for practical surveying, geological excursions, road-making, and the labors of the farm, but, not being able at that time to place the school on an eligible foundation, it was abandoned." (143)

The prospectus gave an ambitious scheme for the school which could hardly have been carried out without large financial resources:

"The exercises designed are the study of the Latin, Greek, French and English languages, Rhetoric, Elocution, Geography and History; the mathematics, as Arithmetic, Algebra, Geometry, Plane and Spherical Trigonometry, Mensuration and Fluxions; Natural Philosophy in its various branches; Astronomy, Chemistry, Mineralogy, Botany and Zoology. No effort will be spared to render these sciences practical and fitted to common life. With that view, particular attention will be given to Composition, Declamation with extempore debates, the uses of Mathematics in common business, Practical surveying, the application of Natural Philosophy to various kinds of machinery and agricultural instruments; testing the principles of chemical science in mixing and preparing soils, farming manures, making cider, beer, spirit and various other articles of agriculture and domestic economy, agricultural, geological and botanical excursions into various parts of the country, examining and analyzing soils, and practical agriculture.

"One prominent object of the school is to qualify teachers. The most approved methods of instruction will be introduced, and lectures will be given on most of the Physical Sciences, attended with demonstrations and illustrations sufficiently plain and familiar to admit of their being introduced into common education. Courses on Natural Philosophy, Chemistry, Mineralogy and Botany will commence at the opening of the Seminary. Ladies will be admitted to the lectures, and there will be a department connected with the Institution where females can pursue any branch of education they may desire." (143)

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Boys were allowed to pay a part of their school expenses by working on the farm. The school is thus described in a memoir of Josiah Holbrook:

"The number of scholars of both sexes during the summer of 1824, was perhaps 50 or 60; among whom were five boys from New Haven, about as many from New York, and some from other places near and remote. The school was certainly an attractive and pleasant one, and those who were so disposed made good progress in useful learning. Several of the boys were instructed with surveying and leveling instruments and used them frequently and successfully. Mr. Coe gave special attention to the Mathematical studies, and Mr. Holbrook gave lectures and instruction in Natural History and allied subjects. The boys rambled extensively over the hills of that region, did some work in hoeing and digging potatoes and in making hay, and once made a pedestrian excursion for minerals to Lane's Mines in Monroe.

"The working of the school was harmonious; a spirit of study generally prevailing among the pupils, and the supply of outdoor exercises and sports was ample." (143)

In the New England Farmer (vol. 3), in 1825 the order of the day for students at the Derby Seminary is stated as follows:

"Rise at 5; exercises in garden or field, one hour; recitations 8 to 12 and 1 to 4; experimental lectures on natural philosophy, chemistry and other subjects 4 to 5; tea at 6, followed by agricultural exercises for one hour."

Boston Asylum and Farm School

A successful school in which elementary instruction in agriculture is given and which illustrates the charity feature of this movement, is the Boston Asylum and Farm School on Thompson's Island in Boston harbor. (232) This school resulted from a meeting in Boston, January 27, 1832, to consider what might be done to aid children needing special attention because of poverty and other disadvantages. The conclusion was ^{that} the establishment of a Farm School in the country, where idle and morally exposed children of the city may be rescued from vice and danger, and may enjoy the advantages of a good physical and moral education, would be not only a great benefit to such children, but would greatly conduce to the peace and good order of this community." To carry out this purpose a "Boston Farm School Society" was formed and chartered. This society purchased a farm of about 140 acres on Thompson's Island, on which it erected build-

ings. Becoming cramped by lack of funds it united in 1835 with the more opulent "Boston Asylum for Indigent Boys", founded in 1814, which had a school in Boston.

A report on the farm school in 1833 states that

"A school is kept both morning and evening for about six hours daily in which are taught the elements of useful knowledge, reading, writing, arithmetic, geography and grammar. During the evening, especially in the winter months, instruction is also given in the first principles of agriculture, horticulture, and botany; the different kinds of soils, the most important processes of cultivation and the names, uses and distinctive qualities of seeds, plants and trees are explained and illustrated. * * * And they are required to perform as much of the manual labor done on the farm as their various ages and capacities will permit." (232)

The New England Farmer (volume 16) contains an account of a visit to this school August 25, 1837, at which time 104 boys were in attendance. In 1901 a more definite course in agriculture was introduced for the elementary grades. In 1907 the name of the school was changed to "The Farm and Trades School". Boys may enter from 10 to 14 years of age if they have reached the sixth grade, and remain until ready for the high school.

Cream Hill Agricultural School (Connecticut)

The Cream Hill Agricultural School, (later called Cream Hill Academic School, with an Agricultural Department), at West Cornwall, Conn. was established (136) in 1845 and continued with considerable success until 1869. The prospectus is as follows:

"The plan of this institution is to receive a select and limited number of pupils, under the superintendence of well qualified teachers, to be fitted for college, or any of the useful pursuits of life.

This school embraces two important departments of instruction. First - Thorough attention to the various elementary and scientific branches taught at the best academic institutions. Second - Both Scientific and Practical instructions in Agriculture and Horticulture, embracing the most approved method of tillage, rearing of stock, cultivation of trees, the laying out of grounds, ornamental gardening, chemical analysis of soils, composts, etc. A portion of each day will be allotted to these subjects, so that the pupil may become a scientific and practical farmer.

The farm, containing 200 acres, with convenient buildings, situated on Cream Hill, surrounded by a picturesque country scenery, furnishes a location unrivalled for healthfulness and freedom from immoral tendencies, and peculiarly fitted for such an institution.

A report on the farm school in 1883 states that

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The Housatonic railroad furnishes daily access to New York. The students will become members of the family of the instructors. A parental supervision will at all times be exercised over each individual. All will be treated with kindness, and every attention rendered, with affectionate regard to health, deportments and morals.

The Institution will be conducted by Samuel W. Gold, Theodore S. Gold and Thomas R. Dutton [who, however, did not actually take part in the school.]

There will be two terms in each year; the first commencing the first Wednesday in May, and terminating the first Wednesday in November; the second from the first Wednesday in December to the first Wednesday in April.

TERMS - The pupils will be furnished with Tuition, Board, Fuel, Lights, Washing, privileges of the Library, and Riding, at \$200 a year, one-half to be paid at the beginning of each term. West Cornwall, Conn., March 31st, 1845." (136)

In the catalogue of 1849 it is stated that

"Each pupil cultivates a garden of about 130 square yards; is instructed in laying out, planting and application of manures. Small premiums are awarded for the best gardens. Ample opportunity is afforded each to acquire a knowledge of general farming, tending and rearing the various kinds of stock, etc." (136)

In a letter to the Director of the Office of Experiment Stations November 8, 1894, Mr. T. S. Gold states that he "taught botany, mineralogy, agriculture, etc., in the classroom and in the garden and field. Some pupils were taught all the operations of the farm."

The school opened with 4 pupils and thereafter the number ranged from 12 to 31. In all, 266 persons attended this school. Among them was George J. Brush, who here acquired an interest in chemistry and particularly mineralogy to which he devoted himself until he became Director of the Sheffield Scientific School at Yale College.

Dr. S. W. Gold was for many years the principal physician in Goshen and shortly before the opening of this school had removed to his farm in West Cornwall.

Theodore Sedgwick Gold (1818-1906), son of Dr. Gold, was born at Madison, New York, graduated at Yale College in 1838 and was principal of Goshen Academy for the next three years. (140) He then returned to his home farm, where he and his father established the agricultural school. He was active in organizing the Connecticut Agricultural Society in 1853 and for years was one of its directors. He also helped to organize the Connecticut Board of Agriculture in 1866 and was its secretary for 34 years. He strongly supported the movement which resulted in the establishment of the Connecticut Agricultural Experiment Station in 1875 and was a member of its Board of Control until his death. He was also active in connection with the founding in 1881 of the Agricultural School at Storrs which is now the Connecticut Agricultural College, and was for twenty years a trustee of this institution. "He was always a student, an extensive reader on subjects relating to natural science, a man having wide acquaintance with men of learning and prominence and withal an excellent, practical farmer." At one time an editor, he was for more than sixty years a frequent contributor to the agricultural press. "His greatest work was the management of the State Board of Agriculture for thirty-four years. When there were no granges, no farm institutes, no field meetings to bring farmers together he made the winter meetings of the Board the great rallying place for all intelligent farmers. He secured the best speakers obtainable on practical farm topics, he gave opportunity for free discussion and always guided it in the right channels; by the use of a 'question box' he brought out points which would otherwise have been overlooked; and with a delicate regard for the feelings of others, a fine sense of humor and unflinching tact he held control of his audience even when feeling ran high, or discussion began to wander too far from the subject or the prolixity of a speaker needed to be repressed." (140)

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Under this wise management the meetings of the Connecticut State Board became of very great educational value to farmers when other educational means were scarce, and the printed reports of the proceedings are unsurpassed for the variety of topics discussed and the intelligent and helpful method of treatment.

The widespread interest in the introduction of instruction relating to agriculture into schools privately maintained during this period, as well as the difficulty of actually accomplishing this in a way which would be attractive or useful to students, is shown in the frequent discussion of this matter in the agricultural and other press and the number and variety of institutions which made the attempt with little or no success. In many cases apparently the effort got no further than an announcement in the catalogue or an advertisement in some paper. In other cases it amounted only to a few lectures on agricultural subjects in connection with instruction in natural sciences or reference to the applications of such sciences to agriculture.

Other Agricultural Schools

The following brief statement about a number of schools may serve to illustrate the scope of this movement.*

In 1824 the trustees of Dummer Academy at Newbury, Essex County, Massachusetts were asked to create an agricultural department. A committee of the trustees conferred about this with the trustees of the State Agricultural Society, who at first seemed willing to establish an agricultural school, with an experimental farm, on lands of the Academy, to be leased to the Society for that purpose. Finally, however, the Society declined to be responsible for this enterprise. A petition to the legislature for aid to finance a professorship of agriculture at the Academy also failed, though supported by the State Agricultural Society.

*In his Cyclopedia of American Agriculture, Bailey has given accounts of a considerable number of institutions which projected courses in agriculture. His material is largely drawn from original sources and has been freely used in this summary.

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About 1826 John B. Yates founded a literary institution at Chittenango, New
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York, "for the purpose of connecting literary pursuits and the education of youth
with practical instruction and employment in many of the useful occupations of life."
Financial difficulties confined its work to literary studies, except that it gave
agricultural employment to a few students. To remedy this the founder asked the
legislature in 1830 to lend him state money on mortgage, but without avail. At that
time Jonathan Ely, A. M., was professor of practical agriculture and the natural
sciences.

In 1827 a bill was before the Senate in South Carolina to establish a chair
of agriculture in the State College at Columbia. This was to carry out the sugges-
tion of W. B. Seabrook in a speech before the United Agricultural Society of South
Carolina. At the same time the president of the college asked the trustees to
establish such a chair but they replied "that the only way to learn agriculture
was between the plow handles."

In 1829 there appeared in the Southern Agriculturist a communication probably
by Dr. Legare, its editor, urging that "The Agricultural Society of South Carolina
should establish a school, to be called the Agricultural Institute", at which there
should be lecturers on mechanics and mechanical philosophy and agricultural chemistry,
together with a "teacher who should demonstrate practically the principles pointed
out in the foregoing lectures, as well as give a history of different domestic animals
and the manner of keeping and raising them."

In 1834 the Genesee Conference of the Methodist Episcopal Church in a
petition to the legislature for a charter for a seminary at Lima, New York, stated
that "the institution was designed for the instruction of youth of both sexes in
literature, science and the fine arts; and also as soon as practicable to combine
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with literature practical instruction in agriculture and the mechanic arts." In re-
cent years this school has had a department of agriculture. (See p.499)

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In 1838 the trustees of Teachers' Seminary at Andover, Mass., voted that the teacher of mathematics should also give instruction in scientific and practical agriculture. This school had been opened in 1830 in a stone building equipped with a chemical laboratory and physical apparatus and had a farm of about 150 acres. The catalogue for 1841 states that "instruction is now being given by lectures but a text-book is now being prepared and when it is completed, Agriculture will be taught as a regular branch of study." Apparently the manuscript of this book by Alonzo Gray, A. M., teacher of chemistry and natural history in the seminary was ready and used in 1842. It was entitled "Elements of Scientific and Practical Agriculture or the Application of Biology, Geology and Chemistry to Agriculture and Horticulture." The next year the seminary was merged with Phillips Academy and the agricultural teaching soon came to an end.

In 1843 the Eden Hill Farm Institute, on the Delaware River, near Philadelphia, Pa., was in operation. James Pedder, editor of "The Farmer's Cabinet", was connected with this enterprise.

The same year an effort was made to establish an "Agricultural Institute" at Bridgeport, Conn.

In 1844 a charter was obtained for Franklin College, near Nashville, Tenn., which had been in operation for some time as an agricultural school. When opened under its new name in 1845, with about 50 students, it was in charge of T. Fanning, editor of the "Tennessee Agriculturist".

In 1844 Oliver Smith (1776-1844) of Hatfield, Mass., uncle of Sophia Smith who founded Smith College for women at Northampton, Mass., left to that town \$30,000 to be used with the accrued interest after 60 years for (1) a pattern farm, (2) an experimental farm and (3) a "school of industry for the benefit of the poor".⁽²³²⁾ The boys selected as beneficiaries "shall receive a good common school education and be instructed in the art and science of agriculture, or in some mechanic art in the shops attached to the premises". The institution was to be

called "Smith's Agricultural School". The School was not opened until 1908, when by the cooperation of the Massachusetts Commission on Industrial Education and the town of Northampton, it was possible to undertake instruction in agriculture and trades for boys and household arts for girls. It is managed by a board of three trustees annually elected by Northampton and is conducted under the direction of the State Board of Education. (See p. 838)

That year the New York Central College was opened at McGrawville, Cortland County, by a Baptist association. Students of both sexes and all races were to be admitted and manual labor was to be united "with intellectual research". The school had a building 100 by 46 feet and four stories high. It was "on a farm of 157 acres of excellent land and thus afforded the best opportunities for pursuing the studies of agriculture, horticulture and agricultural chemistry." About 20 students were present at the opening and their number increased to over 100 during the year.

About 1845 an "Agricultural Institute" was organized at Aurora, Cayuga County, New York.

In 1846, Gardner G. Howland of Flushing, Long Island, offered the American Agricultural Association the use of his farm of 300 acres, all stocked, for five years free of charge for the purpose of establishing an agricultural school. In the same year, "Dr. Daniel Lee, editor of the second 'Genesee Farmer', in cooperation with Gen. Rawson Harmon, opened an agricultural school at Mr. Harmon's residence in Wheatland, Monroe County, New York. The farm contained 200 acres of improved land." (See also Genesee Farmer vol. 7 (1846) p. 103). The Dutchess Agricultural Institute, near Poughkeepsie, New York, began in 1846. That year also some farmers formed an association and organized the "Orange County Scientific and Practical Institute" at Montgomery, New York.

THE BOARD OF DIRECTORS

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Northampton, it was possible to transfer the institution in 1901.

It is a small building, but it is a fine one.

It was founded by Northampton and is conducted under the

direction of the State Board

and was the first of its kind in the State.

Patients of both sexes and all ages are

admitted, and the institution is a fine one.

It was founded by Northampton and is conducted under the

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direction of the State Board and was the first of its kind in the State.

In 1847 a school for students 10 years old and upward was established eight miles from Philadelphia, Pa., and called the Mount Airy Agricultural Institute, where "practical and theoretical agriculture and horticulture, with their attendant sciences", were to be taught, along with "popular" college subjects. In December, 1850, the principal, John Wilkinson, stated that 32 students were attending this school, which had a farm of 70 acres. Students spent a part of the day in farm work, and in the literary department studied natural sciences as applied to agriculture, classics and modern languages. "Each student is required to lecture upon the science he is pursuing, to make surveys with plots of the same, and also to keep a replete journal or diary of all experiments and farm operations. Two evenings of the week are spent in the discussion of practical subjects, on which full notes are preserved for reference." (See U. S. Patent Office Report for 1850, p. 578).

In 1849 at a convention in New Hampshire discussing the formation of a State Agricultural Society Prof. E. B. Sanborn of Dartmouth College advocated "model farm schools", particularly for poor boys. He also said "If the State would employ a professor of agricultural science to hold conventions of farmers and lecture in the various counties of our State, many useful improvements might be easily introduced."

In 1850 Judge Burwell and other gentlemen of Buffalo founded the "Oakwood Agricultural Institute" at Lancaster, Erie County, New York, and employed W. H. Brewer, afterwards Professor of Agriculture in the Yale Scientific School, to be the agricultural teacher but when the school opened he was made principal. Only about a dozen boys of fourteen to seventeen years of age attended the first session beginning in April, 1851, and were sent home in the fall. Mr. Brewer spent the winter in giving lectures on elementary and agricultural chemistry in the county.

In 1851 an act was passed by the Florida legislature to establish two seminaries as normal schools, which were to give instruction in mechanic arts, husbandry and agricultural chemistry but this was not fully carried out.

Beginning in 1851, James J. Mapes had students on his farm near

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The wide-spread development of secondary education through public high schools and private preparatory schools led to considerable standardization of courses of study in such schools and the requirement of college training for their teachers. The influence of the colleges very generally permeated the secondary schools and brought about the restriction of their field to general education. Sentiment in favor of vocational education in any line in the secondary schools was little in evidence. There were practically no trained teachers of agriculture to be had and the limited literature of this subject was ill adapted for use in schools. Public attention was more and more directed toward efforts to establish agricultural colleges. It seemed to be dimly understood that these higher institutions would be needed before agriculture could be successfully taught in the lower schools and many people thought that such colleges would supply all the agricultural instruction which it was worth while to give.

The movement for the teaching of agriculture in secondary schools therefore waned and by the time of the outbreak of the Civil War, such instruction had almost entirely disappeared in this country.

Agricultural Instruction in Private Colleges

Rensselaer Institute

The Rensselaer Institute at Troy, New York, occupied a unique position in the early movement for scientific education related to agriculture and the mechanic arts. (327 and 414) This school was founded in 1824 by Stephen Van Rensselaer (1764-1839). He had become by inheritance patroon of a district originally 24 by 48 miles in extent, comprising what are now Albany, Columbia and Rensselaer Counties. This great tract as developed up to his death in 1839 contained over 3,000 farms, which were leased on moderate terms. Van Rensselaer was greatly interested in the improvement of agriculture, became a leading member and officer of the State Society for the Promotion of Useful Arts and in 1820 was president of the newly created State Board of Agriculture. He graduated at Harvard College in 1782 and through his interest in

the private primary schools led to considerable standardization

and the recruitment of college students

The Ministry of Education and Scientific Research

has been working for the development of secondary education

and the improvement of the level of educational attainment

of the population. It was little in evidence

of the importance to be given to the limited literacy of this population

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education was made a regent of the University of the State of New York and became its chancellor in 1835. He was also active in politics, being a member of both houses of the state legislature, lieutenant-governor for six years and a Member of Congress, where he served as chairman of the Committee on Agriculture. He was on the first State commission to explore a route for a canal between the Hudson River and the lakes and later on the Erie Canal Commission.

About 1820 Van Rensselaer came in contact with Amos Eaton, who had already attracted considerable attention as an itinerant lecturer on natural science. Eaton (1776-1842) was the son of a farmer at Chatham, New York, graduated at Williams College in 1799, studied law and practiced this profession at Catskill, New York, but became enamored of the field study of botany and mineralogy. In 1810 he began to give popular lectures on botany and compiled an elementary treatise on this subject. Then he went to Yale College and studied chemistry, geology and mineralogy under Silliman and botany under Ives. Going back to Williamstown, Massachusetts, in 1817 he lectured outside the college on botany, mineralogy and geology and so interested the students that they published his Manual of Botany, which was gradually enlarged and in its 8th edition in 1840 contained descriptions of 5,267 species. He also gave lectures in a number of the large towns in New England and New York and in 1818 on invitation of Governor Clinton spoke to the New York legislature on geology and its application to agriculture through surveys. Two years later he was called to the professorship of natural history in the somewhat famous Medical College at Castleton, Vermont. What attracted the greatest attention in connection with Eaton's lectures was that he not only illustrated them with specimens and demonstrations but led his students to make collections in the field and to construct simple apparatus for various purposes. This had come about from his experience as a boy on the farm. When about fourteen years old he acted as a chainman during a land survey and determined to become a surveyor. A local blacksmith and himself made a needle and working chain and "the bottom of an old pewter

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plate, well smoothed, polished and graduated" served as a compass-circle. With these home-made instruments this boy did occasional surveying in the neighborhood. In later years he elaborated this plan in his teaching. Professor James Hall, who studied under him, said that "Professor Eaton taught us the manipulations in science with the simplest materials so that a student could go into the forest and construct a pneumatic trough or a balance and perform there his experiments in chemistry or physics." (414)

In 1820 the State Board of Agriculture employed Eaton to conduct a geological and agricultural survey of Albany and Rensselaer Counties and Van Rensselaer paid the expenses of this survey, which was the first of its kind in this country. Analyses of soils were included and a discussion of methods of culture. The results of the survey were published in three volumes of Transactions and Memoirs. The State Board soon went out of existence but Van Rensselaer in 1822 provided funds for a larger enterprise. Under direction of Eaton and with the cooperation of Dr. Hitchcock of Amherst College and others a geological survey was made from Boston to Lake Erie over a belt fifty miles in width, which in New York covered the line of the Erie Canal.

Impressed by the unusual ability of Eaton, Van Rensselaer then employed him "in the summer of 1824, to traverse the state on or near the line of the Erie Canal, provided with sufficient apparatus and specimens to deliver, in all the principal towns where an audience of business men or others could be collected, a series of lectures, accompanied with experiments and illustrations, on 'chemistry, natural philosophy, and some or all of the branches of natural history.' This undertaking was entirely successful." (414)

To perpetuate and broaden such work Van Rensselaer established in the fall of 1824 a school to instruct persons "in the application of science to the common purposes of life." In the language of this purpose is seen the influence of Count Rumford, who in 1799, used the same words to describe the aim of the Royal Institution of London which he was founding.

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Referring to the success of Eaton's summer lectures in western New York Van Rensselaer declares that his principal object in establishing a school is "to qualify teachers for instructing the sons and daughters of farmers and mechanics in the application of experimental chemistry, philosophy, and natural history to agriculture, domestic economy, the arts and manufactures. * * * Apparatus for the necessary experiments has been so much simplified, and specimens in natural history have become subjects of such easy attainment, that but a small sum is now required as an outfit for an instructor in the proposed branch of science; consequently every school district may have the benefit of such a course of instruction about once in two or three years as soon as we can furnish a sufficient number of teachers." (414)

He appointed a board of 9 trustees, among whom was Simeon DeWitt, and chose Eaton as senior "professor of chemistry and experimental philosophy, and lecturer on geology, land surveying and the laws regulating town officers and jurors", and Lewis C. Beck as junior "professor of mineralogy, botany and zoology, and lecturer on the social duties peculiar to farmers and mechanics." Eaton's influence is seen in the "order" regarding the course in chemistry. "The students are to be divided into sections, not exceeding five in each section. These are not to be taught by seeing experiments and hearing lectures, according to the usual method. But they are to lecture and experiment by turns, under the immediate direction of a professor or a competent assistant. Thus by a term of labor, like apprentices to a trade, they are to become operative chemists." (414)

The board at first arranged for day and afternoon courses in experimental chemistry and evening lectures on chemistry, experimental philosophy, mineralogy, geology, botany and zoology, "to prepare operative chemists and practical naturalists, properly qualified to act as teachers in villages and school districts." Summer and winter terms were contemplated and "with the consent of the proprietors a number of well-cultivated farms and workshops in the vicinity were to be used as places of exercises by students in applications of the sciences." After a year's trial on

this basis the school was incorporated March 21, 1826 and a similar plan of operation was elaborated to cover three terms. Beginning in the fall each student was to give five lectures a week for three weeks on systematic botany and collect, analyze and preserve plants or examine operations in the school workshops, and during the next twelve weeks 60 lectures divided between mineralogy and zoology, chemistry, natural philosophy, including astronomy, and on metals, soils, manures, mineral waters, and animal and vegetable matters, with experiments and observations in workshops. In the winter term there were to be recitations on the sciences, rhetoric, logic, geography, mathematics necessary for surveying, mensuration, and astronomy. Students were to lecture again in the first six weeks of the spring term on experimental philosophy and chemistry, metalloids, metals, soils and mineral waters and for the remainder of the term were to analyze soils, manures, animal and vegetable substances, ores and mineral waters; observe on school farms the progress of grains, grasses, fruit-trees and other plants, do surveying and make calculations on the application of water power and steam to various machines and the laws of hydrostatics and hydrodynamics in locks, canals, aqueducts and waterfalls.

"In every branch of learning the student begins with its practical application and is introduced to a knowledge of elementary principles, from time to time, as his progress requires. After visiting a bleaching factory he returns to the laboratory and produces chlorine gas and experiments on it until he is familiar with all the elementary principles appertaining to this curious substance." (414) Professor Eaton was much opposed to athletics as commonly practiced in colleges and substituted as "amusements" exercises in land surveying, general engineering, collecting and preserving specimens in botany, mineralogy and zoology, examining workshops and factories, watching the progress of agricultural operations, making experiments on fertilizing materials for vegetables in the experimental gardens, etc. Beginning with 1827 he began taking students on tours on the Hudson River and Erie Canal to observe and to make collections. Unsuccessful attempts were made to carry out the

~~1836-~~

original purpose by establishing branches in the state and by showing academies and common schools how to teach science and its applications with cheap apparatus.

At one time it was proposed to give a student from each county free tuition if he would agree to teach by the experimental method for one year. During the first ten years the institution was for the most part a school of science, with emphasis on its practical applications. Its requirements were relatively severe and comparatively few students were able to meet them. It did not have more than 25 students at any one time but a considerable number of these were graduates or members of colleges.

Courses relating to surveying and other branches of engineering were gradually developed and in 1835, after the name of the school had been changed to Rensselaer Institute, it was divided into departments of natural science and engineering. The latter gained the ascendancy and about 1850 it became a great school of engineering under the name of Rensselaer Polytechnic Institute.

This institution undoubtedly had considerable general influence on the movement for scientific education relating to agriculture and mechanic arts which culminated in the land-grant act of 1862. It was well known to those leaders in New York and other states who were promoting the establishment of colleges and other public agencies for the promotion of agriculture. Some of its students had direct relations with this movement.

Ebenezer Emmons of the class of 1826 became chief of the agricultural section of the New York State Geological Survey and between 1846 and 1854 issued important reports on soils, crops, fruits and noxious organisms. Asa Fitch, Jr., graduated in 1827, specialized in entomology and became State Entomologist. James Hall, of the class of 1832, became eminent as a geologist and extended his influence as far west as Iowa, where during a brief connection with the Iowa State University in its early days he helped in starting the movement which resulted in the establishment of the Iowa State College of Agriculture and Mechanic Arts. Ezra Slocum Carr,

~~1891~~

graduated in 1838, became the first professor of chemistry as applied to agriculture in the Universities of Wisconsin and California. In the latter state he laid the foundations for the experiment station at the university and was active in the affairs of the Grange, whose history he published.

George Hammell Cook, of the class of 1839, specialized in geology but had a broad interest in other sciences and their practical applications and became professor of chemistry and natural sciences in Rutgers College in New Jersey, and of geology and agriculture in 1880. He was state geologist for many years and influential in the establishment of the State Board of Agriculture. He was also the first director of the New Jersey Agricultural Experiment Stations.

Washington (now Trinity) College

In 1824 the first catalogue of Washington (now Trinity) College at Hartford, Conn., announced that

"An Agricultural establishment will be connected with the institution, and the students will have an opportunity of becoming acquainted with this primary art of living, by the courses of lectures, illustrated by the practical operations of farming and gardening. Military exercises will also be embraced in the system as a healthful occupation for some of the hours usually devoted to recreation." (5)

A botanic garden was also maintained at the college for a considerable period and courses in "Practical Applications of Chemistry and Botany" were listed in a number of early catalogues.

Bussey Institution

In a will dated July 30, 1835, Benjamin Bussey of Roxbury, Mass., gave to Harvard College half the income of about \$300,000 and his farm of over 200 acres on condition that there be established on this farm "a course of instruction in practical agriculture, in useful and ornamental gardening, in botany, and in such other branches of natural science as may tend to promote a knowledge of practical agriculture and the various arts subservient thereto and connected therewith, and cause such courses of lectures to be delivered there at such seasons of the year and under such regulations as they may think best adapted to promote the ends designed;

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and also to furnish gratuitous aid, if they shall think it expedient, to such meritorious persons as may resort there for instruction; the institution so established shall be called the 'Bussey Institution'." (232) Though the will was probated in 1842, it was not deemed advisable to begin the establishment of the Bussey Institution until 1870. It has since been conducted mainly as a research institution. (See p. 399)

Amherst College.

In 1843 Amherst College in Massachusetts listed in its catalogue a "Lecturer in Agricultural Chemistry and Mineralogy", and in 1852, under the presidency of Edward Hitchcock, a Scientific Department "entirely independent of the regular course" was established. (232) In this department Rev. J. A. Nash, A. M., as instructor in agriculture, and later author of the text-book entitled "The Progressive Farmer", was to "take charge of any who may wish to study the elements of agriculture, theoretically and practically", and William S. Clark, Ph. D., afterwards president of the Massachusetts Agricultural College, was to give "practical instruction in Analytical and Applied Chemistry, with special reference to Agriculture, Pharmacy and Metallurgy". This department was discontinued in 1857.

The Country Gentleman contains an announcement, dated December 23, 1853, by Mr. Nash, of his course in practical and scientific agriculture for "young men not pursuing a full collegiate course". Instruction will be given, through text-books, lectures and free conversations, "on the applications of science to the cultivation and improvement of soils, the preservation and use of manures, the growing and disposal of crops, the care of animals, and generally, to whatever relates to the management of a farm". Students may take the whole or a part of this course and may have access to other lectures by the president and professors of Amherst College. "The teacher of agriculture will accompany his class to the lectures on geology, chemistry, philosophy and natural history and then at the earliest opportunity will review with them the subject of each lecture in a way to show its practical bearings and to fix it in the memory."

~~1894~~

Farmers' College in Ohio

In 1846 an institution entitled Farmers' College was organized at College Hill, Ohio, six miles from Cincinnati. (441) This was an outgrowth of a literary school, known as Pleasant Hill Academy, begun in 1833 by Freeman Grant Cary, (1810-1888), a cousin of Alice and Phoebe Cary, and a graduate of Miami University, Oxford, Ohio, in 1832. Beginning with four pupils, the number steadily increased to an average of over 100. In all, nearly 1200 students attended this academy. It had several buildings, including a substantial brick structure.

In 1845 a plan was made to enlarge the school by issuing stock for "a building for an institution of learning especially suited to the wants of the agricultural and business community." The building was to be called Farmers' Collegiate Hall of Hamilton County. Over 400 persons, mostly farmers and mechanics, contributed. A charter, granted by the legislature February 23, 1846, created a corporation entitled "Farmers' College of Hamilton County". "The objects of this association shall be to direct and cultivate the minds of the students in a thorough and scientific course of studies, particularly adapted to agricultural pursuits." The stockholders were to elect 15 trustees for a three year term, who would establish the curriculum, "with the approbation of the instructor" and grant certificates and diplomas.

About $7\frac{1}{2}$ acres of land adjoining the site of the Academy were obtained and on this tract a 3-story brick building, 120 x 48 feet, with 27 rooms was erected, costing with its furniture about \$13,000. At the first commencement of the new institution, September 23, 1847, 5 students were graduated from the academy and given diplomas as "American Scholars". In 1855 the legislature gave the college authority to grant the degrees of A.B. and A.M. The original faculty of the college included the president, who was also professor of moral philosophy and rhetoric and 4 other professors, together with a teacher of the primary department. John H. Scott, D. D., a native of Pennsylvania and graduate of Washington College, who had also studied science under Silliman at Yale College, was professor of chemistry and its application

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to agriculture and the arts until 1849. Benjamin Harrison, afterwards President of the United States, was a student in this institution in 1848-50.

In 1850 a committee of the board of trustees made an elaborate report favoring an elective system, which would not require "the study of the dead languages, or the pure mathematics as a necessary part of a liberal education." A minimum course only was prescribed. This was in accordance with ideas previously held by President Cary, who had stated that "every man had a special right to that kind of education which would be of greatest value to him in the prosecution of useful industry."

In 1851 a plan for securing a permanent endowment for the college through subscriptions for limited and perpetual scholarships was launched and over \$100,000 was raised for this purpose. An Act was secured from the legislature April 9, 1852 authorizing the transfer of control of the college to the holders of perpetual scholarships and this arrangement was speedily put into effect. Originally it had not been intended to make agriculture a distinct branch of instruction in the Farmers' College but simply to include in the course some of the applications of science to agriculture. In the catalogue for 1851 President Cary said, "While we afford opportunities for mastering those departments of science which are most susceptible of application to agriculture and mechanic arts far greater than other institutions furnish, we have made ample arrangements to meet the wants of those who aspire to be scholars in the highest sense of the word." But evidently this did not wholly satisfy a growing demand for more practical instruction. This led the board of trustees to pass a resolution, "That it is expedient to provide at the earliest practicable day the means of elucidating in practical Agriculture and Horticulture such students as may desire such course of instruction or whose parents or guardians may direct such course for them". The field agent of the college also reported that the public desired to have an experimental farm, February 9, 1853; the board resolved to raise \$100,000 "to secure a farm and establish an agricultural professorship and department of practical agriculture and horticulture and constitute a building fund."

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The committee to prepare a plan for subscription reported that "it was the original design to connect with this institution a farm for scientific and practical experiments in agriculture and horticulture, including the analysis of soils and their adaptation to the various products of the earth. * * * A college furnished with ample facilities for applying the principles of science to husbandry and the mechanic arts is indispensable in developing the resources of the country."

President Cary resigned to take charge of the Farm Department and to raise funds for its support. William Cary gave \$10,000 for this department and a Cary professorship of Practical Agriculture was established in his honor.

The catalogue of 1854-55 contains the following statement of the plans for the agricultural department:

"Pursuant to the original design of the Institution, particular attention is given to instruction in those branches of Natural Science more directly appertaining to Agriculture. And we have now the satisfaction of announcing to our patrons, and to the public, that the Department for Instruction in Scientific and Practical Agriculture and Horticulture, is now fully organized under three appropriate Professorships, with a Model and Experimental Farm, wherewith to demonstrate and make practical lessons of Science;- The First Complete Institution of the Kind Organized on the Continent of America!

For this object alone, within the past year, the sum of One Hundred Thousand Dollars has been secured, and a Farm, most suitable to the purpose, and beautifully situated in immediate proximity to the College, has been purchased; an excellent Engineer and scientific Landscape Gardener, Mr. Maximilian G. Kern, has been permanently employed, and is now actively engaged, with an efficient force, in adjusting the grounds to the design of the Institution in that behalf. Preparations are in progress for erecting a large and beautiful structure, designed to provide ample space for Laboratory, Lecture-rooms, Cabinets, Agricultural Library, etc., with basement accommodations for the preservation of Fruits and Annuals for the Farm, and the Workshops and Machinery necessary for its demands.

The Course of Study in this Department will be prescribed by its Principal in conjunction with the President and Faculty of the College, under the sanction of the Board of Trustees. To this Department students will matriculate, as in the College proper; and the scientific studies herein prosecuted will be available, to their full import, for a degree, on graduation; the same as though pursued in any other department of the College course.

The great purpose will be to make practical the principles, and to make visible the results of those scientific laws, learned by the student in the laboratory:- To show the various methods by which to reclaim waste, and to restore exhausted lands; to increase production at the least possible expense to the virgin fertility of the soil; to demonstrate, by experiment, the best modes of culture of grains, grasses, grapes, fruits and garden vegetables; as

~~1884~~

also to show the habits and explain the culture of plants and flowers, both native and exotic. Particular attention will be given to Natural History, in all its branches; especially in relation to the growth, habits, and characteristics of the various destructive insects, with a view to the prevention of their ravages of our fruits, and flowers, and forests.

Much of the instruction will be given in the Field, and in the Botanic Garden. A minute record will be kept; the facts and results of all experiments carefully noted; and accurate reports frequently made: And, to serve as a vehicle for these, as well as other useful and interesting matter, collected from other courses, a Monthly Journal will be established, to be issued from the College.

The Experimental Farm will be made the theatre for exhibiting, systematically, and contrasting fairly, the merits of the various seeds, etc., received from the United States Patent Office, and from other sources, domestic and foreign; and when their merits are experimentally determined, they will be held for distribution throughout the country, accompanied with a full and explicit history of their habits, growth and culture.

While aiming essentially to the attainment of the practical and the useful, in the arrangement of the grounds for fruitage and flowers, into garden and grove, into lakelet and lawn, we will, nevertheless, be carefully studious of securing the beautiful. In this manner the Farm itself must become a place of interest to both the admirers of the useful, and the lovers of the beautiful. Here, Botany will be taught, not as a mere catalogue of difficult names, but as embracing the principles of vegetative organism, and the laws of vegetable life. In Chemistry, the student will not only be instructed in the principles of the science, but will, also, be exercised in the Laboratory, be made familiar with the apparatus, and be taught to manipulate in the analysis of soils, their products and their fertilizers.

While it forms no part of our plan to make this a "Manual Labor Institution", so called, yet the demands of the Model Farm itself, will furnish, to any student desiring it, an opportunity for employment in such manner as to contribute to both health and pecuniary profit. For, though the regular class-proceedings in scientific experiments, on the farm, in the garden, and in the orchard, as in the laboratory, will be, of course, without pecuniary recompense to them, yet there will be very much to be done, not falling within the purview of the studies of the class, which any student may, at his option, find employment in, and receive therefor his proper remuneration."

The curriculum of this department was outlined as follows:

Four years' Course
Freshman Class

First session.

- Bay's Second Part Algebra.
- Bonnycastle's Mensuration of Surfaces and Solids, as applied to Artificers' Works.
- Wilson's American History.
- Natural Philosophy.
- English Composition.
- Ornamental Drawing.

Second session.

- Plane geometry.
- Anatomy, Physiology, and the Laws of Health.
- Stephen's Book of the Farm Commenced.
- Field Lectures on Agriculture and Horticulture.
- Essays on Practical Agriculture.
- Drawing Ground Plans and Elevations.

Sophomore Class

First session.

Plane Trigonometry and Surveying.
 Davies' Descriptive Geometry.
 Stephen's Book of Farm, with Field Lectures.
 Isometrical and Perspective Drawing.
 Essays on Scientific Agriculture, etc.
 Garden Designs, Laying out of Grounds.

Second session.

Solid Geometry and Spherical Trigonometry.
 Davies' Shades and Shadows, with Exercises in Drafting.
 Political Economy.
 English History.
 Field Lectures, with Lessons from Natural History.
 Essays on History, Agriculture, etc.

Junior Class

First session.

Davies' Analytical Geometry.
 Olmstead's Mechanics.
 Mental Philosophy.
 Rural Economy (embracing Physical Phenomena of Vegetation, Soils,
 Fertilizers, Rotation of Crops, Meteorology, as
 Applied to Agriculture.)
 Rural Architecture.
 Essays on Various Subjects.
 Lectures on Farm.

Second session.

Davies' Calculus.
 Robinson's Astronomy.
 Elementary Chemistry.
 Wayland's Moral Science.
 Philosophy of History.
 Landscape Gardening.
 Essays on Moral Science, etc.

Senior Class

First session.

Philosophy of Rhetoric.
 Civil Engineering.
 Agricultural Chemistry, with Chemical Field Lectures.
 Entomology, with Field Lectures.
 Essays on Rhetoric, etc.

Second session.

Geology and Botany, with Field Lectures.

Coleman's European Agriculture.

Paley's Natural Theology.

Alexander's Evidences of Christianity.

Essays on various subjects.

Prize Essay on Agriculture or Horticulture.

Prize for the best Drawing or Model (for the Arrangement of Farm Buildings, for one or two hundred acres.)

In addition to the Field Lectures, there will be, during the course,

lectures on

Chemistry,

Geology and Mineralogy

Natural Philosophy,

Sacred and Profane History,

Anatomy and Physiology, embracing the Laws of Health. (440)

The monthly journal began January 1, 1856, and the first volume covered 608 pages. It was called "The Cincinnatus, published at Farmers' College, College Hill, Ohio, 1856", and contained articles on a great variety of agricultural subjects, including agricultural education, accounts of experiments, agricultural production and economics, meteorology, etc. (436) It continued through five volumes. In the first volume it is stated that 100 acres of land were purchased "for a model and experimental farm", a botanic garden of 20 acres was being laid out, with vegetables, fruits, shrubs and forest trees of many varieties - the whole farm to constitute "a grand laboratory". Small lots for variety tests were to be made on the farm. The building, called Polytechnic Hall, was completed in the fall of 1856 and dedicated with appropriate ceremonies, including an address by Mr. Cary on "Industrial University Education - Its Mission". This building contained rooms for professors of chemistry, botany and vegetable physiology, and theoretical and practical agriculture, a chemical laboratory, a shop with forge and other mechanical apparatus, etc. "Every student is to be an operator."

The College as a whole grew in popularity and in 1856 had 330 students. But its funds were not sufficient to maintain it on the scale on which it was being operated and as the shadow of the Civil War approached it was difficult to secure adequate financial support. Two memorials were sent to Congress, asking for grants of land for the college but without avail. An effort to have this college made the beneficiary of the land-grant act of 1862 also failed. The professorship of agriculture was nominally maintained until 1880, but long before that the farm department had disappeared and the farm itself had been sold. In 1884 the institution became Belmont College and this was merged into the Ohio Military Institute in 1890.

The Movement toward Public Support of Agricultural Colleges.

While the teaching of agriculture in purely private institutions was being attempted with small success, friends of agricultural education began to look forward to State aid for such instruction and in a few States movements were begun which were to lead up to the establishment of State agricultural colleges and their endowment under the national Land-Grant Act of 1862.

New York.

There is little doubt that after the attempt of Dr. Mitchill to teach science in its relations to agriculture at Columbia College in 1792 (p. 92) the group of influential men who were prominent in the early Agricultural Societies in New York discussed from time to time the possibility of doing something for agriculture in colleges or through professorships connected with the societies or other institutions. This came to the surface as (p. 108) already stated in Gov. Clinton's message of 1818 favoring a State Board of Agriculture, wherein he also suggested that a professorship of agriculture might well be "connected with the board or attached to the university".

DeWitt's Plan for an Agricultural College

The following year his cousin, Simeon DeWitt, published anonymously at Albany a pamphlet of 42 pages entitled "Considerations on the Necessity of Establishing an Agricultural College and having More of the Children of Wealthy Citizens Educated for the Profession of Farming." (343) Simeon DeWitt (1756-1834) was a native of Ulster County, New York, but died at Ithaca, of which he was the founder. He studied at Queen's (now Rutgers) College in New Jersey but did not graduate though he was afterwards given the degrees of A.B. and A.M. by that institution. In connection with his service in the Revolutionary Army he was chief geographer and for more than 50 years was surveyor-general of New York. In 1798 he became a regent of the University of New York and its chancellor in 1829, when he originated the taking of meteorological observations by the academies. He was one of the original members of the first New York Society for the promotion of agriculture, went over into its successor, the Society for the Promotion of Useful Arts, and was its second president (1813-1819), frequently contributing to its proceedings. As early as 1799 he publicly advocated "a school of practical instruction in the business of husbandry", in which the teaching of the art and science of agriculture should be combined.

His pamphlet on an agricultural college was addressed primarily to the "thousands of wealthy citisens in this State who do not know what to do with their sons." The common practice was to send such boys to a college "without any determinate object in view and after they have had this "instruction in the dead languages and the ordinary sciences", and have received a diploma, the professions of "law, physic and divinity" are ordinarily their only "means of living and rising into consequence." "but so great are the numbers of young gentlemen destined for those professions, that their prospects are truly dismal; but what other provision can their fathers make for them? Turn them to some mechanix employment? that is considered too degrading; To manufacturing? it has been tried and proved ruinous; To mercantile business? that, too, is overstocked; To the army or navy? there is little room there, and

many reasons against it. To farming? nothing, it is said, can be made by it."

He attempts to show that farming is not only honorable but may be and often is profitable and that even its difficulties and hardships are much better for men to contend with than a life of idleness. In foreign countries gentlemen are in many cases owners of large estates in the management of which they often endeavor to improve agriculture by experiments, the results of which they disseminate to their tenants and through societies or boards of agriculture.

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"Thus, then, landlord's farm, becomes to a certain degree, a school of practical agriculture, where experiments are constantly made, by wealthy, scientific, and practical men, to ascertain the best methods of profitable culture; where the knowledge of it is transmitted as a family inheritance, and sheds its meliorating influence, immediately over a wide circle of tenantry, and remotely over the kingdom at large. And even in those countries there are not wanting some arrangements in their academical establishments for teaching the scientific parts, if not the actual practice of agriculture." (343)

The absence of such a class in this country has led the small, but independent farmers to follow traditional methods and thus to prevent improvements in agriculture. The agricultural societies are doing something to remedy this situation. "The institution now proposed will not be their rival but rather a cooperator." "It is intended not so much to give instruction to farmers as to make farmers from other classes of society."

"It may be called an agricultural school, academy or college, no matter which; but if any importance is to be attached to names, I would give it the most respectable, and call it The Agricultural College of the State of New York.

Its primary object should be to teach the theory and practice of agriculture, with such branches of other sciences as may be serviceable to them: its secondary, to make improvements." (343)

On the faculty should be a "professor of practical agriculture acquainted with both theory and practice and capable of making experiments. He will have direction of the labor of the students in the field."

"Instead of giving formal lectures, this professor, who must constantly attend his classes while thus engaged, will, during the progress of their work, explain to them the best manner in which every thing is to be done, the reason of it, and the errors that are or may be committed in it; on all which, the students will be required to make notes and comments at their hours of relaxation, and undergo examinations at stated times." (343)

There should be a farm of considerable extent and variety of soil and it should "be made not only instructive, but, if possible, profitable." A workshop for the repair of implements by the students and for a collection of "models of all the best implements of husbandry" should be provided. Account books should be kept in detail of all the farm transactions and the professors should lecture on this subject.

DeWitt's plan for an agricultural college was given considerable publicity in various ways in New York and other States and undoubtedly laid a somewhat definite basis for consideration of this subject in legislatures and elsewhere. It had, however, one unfortunate result in giving credence to the idea, often urged by opponents of public aid to agricultural colleges, that they were to be institutions for the rich and therefore not worthy of support from public funds.

Elkanah Watson's Plan for a Pattern Farm.

In 1819 Elkanah Watson (See p.103) issued a plan for a pattern farm of from 100 to 200 acres under the Board of Agriculture with a professor of agriculture to carry on experiments on crops, trees, implements, architectural plans, animals, manures, "and all that relates to chemistry, horticulture, botany and mineralogy." (429) Provision was to be made for the education there annually of 20 young men at the expense of the agricultural fund. These students were to be selected by the presidents of the agricultural societies. There were to be classes on the theory and practice of agriculture and student labor at least three hours a day. The next year these students should teach in academies or schools under direction of the county societies and be provided with cheap books on the first elements of agriculture and chemistry. Watson, however, states that he did not

expect this plan to be adopted for some time to come.

Jesse Buel's Plan for an Agricultural School.

In 1823 there appeared in the New York Assembly an agricultural leader who was to keep up for about 15 years a persistent campaign for the establishment of an agricultural college. This was Jesse Buel (1778-1839), a native of Coventry, Connecticut, who had learned the printer's trade at Rutland, Vermont, and thereafter published papers in Troy, Poughkeepsie and Kingston, New York. In 1813 he established the Argus at Albany, which for many years was an influential journal, and was its editor until 1821. During this period he was also state printer. While a resident of Kingston he was judge of the court of common pleas. After retiring from the Argus he settled on a small farm near Albany, which he greatly improved through experiments in agriculture and horticulture.

As a member of the committee on agriculture of the New York Assembly in 1823 Buel brought in a report favoring an agricultural school. The following is a summary of the principal conclusions in this report:

"We have a national school for teaching the art of war * * * yet we have no school of agriculture, a business more complicated in its details and requiring greater diversity of knowledge than any art which is taught." Reference is made to agricultural schools in Great Britain, France, Switzerland, Prussia, Italy and Austria, and the organization of the Fellenberg School at Hofwil, Switzerland, is outlined. It is stated that the subject has been before the legislature of Pennsylvania and that Virginia has begun to act. Reference is made to the Albemarle Society and its effort to secure a professorship of agriculture in the University of Virginia. The advantages of the agricultural school are set forth as follows: (1) It will collect, adapt, demonstrate and disseminate "the best systems and most recent improvements in husbandry from Europe and America"; will introduce and multiply improved machinery, test these, and encourage invention; an experimental farm will test grains, grasses, plants and animals from abroad, and will issue periodical publications for dissemination of information, as well as through the students. (2) Will benefit commerce and manufactures through the increased production and profits of agriculture. (3) Will "improve the morals of society" by promoting industrious habits, desire to excel, and the dignity of agriculture. (4) Will tend to augment the revenues of the State; and (5) Will have a good influence politically by furnishing a body of educated yeomen who

could creditably fill public offices.

The curriculum should cover every branch of science relating to agriculture and every department of practical husbandry. Tuition should be low. Appropriations should be loans rather than donations. It is stated that Hon. Stephen Van Rensselaer has offered land. The school will supersede the Board of Agriculture, and might have the \$10,000 now annually given to the county agricultural societies. For its support a tax on bank stock is suggested. On the state appropriations to colleges and schools an agricultural school should be included. A bill to establish the school accompanies the report. (403)

In a letter to W. M. Barton, vice-president of the Agricultural Society of the Valley of Virginia, December 6, 1823, Buel refers to this report and states that he considers the plan of the Albemarle Society for a professorship of agriculture at the University of Virginia defective because "it makes agriculture an auxiliary study", whereas "it ought to be the principal, and botany, chemistry, literature, etc., should be subservient to this great study." "The pupil should go to it with the express view of learning to be a farmer."

In 1825 the New York Committee on Agriculture reported that "it is in some measure indispensable to establish an experimental farm in connection with an agricultural seminary" but "while the committee indulge a belief that such a system will eventually be established to its full extent, yet they apprehend that public sentiment is not yet sufficiently mature to embrace the plan."

In 1826 James Tallmadge, then lieutenant-governor of New York, in the report of a committee to enquire into the condition of the College of Physicians and Surgeons in New York City "urged that it was not sufficient that the sciences connected with agriculture and the mechanic arts should be diligently studied and correctly understood by a few votaries in our literary institutions." He therefore advocated lectures on these subjects in public schools and colleges.

New York State Agricultural School

In 1832 at the first meeting of the new State Agricultural Society a committee was appointed to report on a plan for an agricultural school. Pending this report the Albany Argus began a series of articles, undoubtedly by Jesse Buel, to call public attention to this matter. In the first article it was pointed out that the present colleges and academies "are vestibules to the learned not to the laborious employments; to the few, not to the many." Yet the State has spent more than two million dollars on professional schools but nothing for agricultural schools though "the business of husbandry may be compared to the healing art."

The author advocated

" a school which shall combine with a literary and scientific education practical instruction in farming and gardening" will include chemistry, mechanical science, animals (anatomy, diseases and breeding), properties of soils, theory of manufactures, farm accounts. The institution should have a garden and an experimental department. The author does not expect farm boys to attend this school in large numbers, but a hundred young men "sent annually into different sections of the State would not fail to produce an effect highly beneficial to all." Educated farmers are needed in the country to maintain "wisdom and liberality in the acts of our public councils." The school will promote improvements in agriculture and increase products, enlarge useful knowledge, bring prosperity to all branches of business and augment the resources of the State. Its moral and political influence will be great."

on agriculture

On February 14, 1833 the committee reported a plan for a school, with an estimate of expense, assuming "as reasonable data that the number of pupils would average 200 and the average produce of the farm amount to \$4000 per annum (5) for the first 4 years." The summary of estimates is as follows:

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~~1881~~

Preliminary Expenses.

Farm of 400 acres, at \$30 -----	\$12,000.
Farm buildings -----	6,000.
School buildings -----	25,000.
Library and apparatus -----	7,500.
Stock and implements -----	3,150.
Shops and tools -----	1,250.
Furniture for school -----	1,150.
Incidental -----	1,500.
Total preliminary expense -----	\$57,550.

Annual Expense.

Salaries of officers and teachers of the school -----	\$ 5,100.
Salaries of manager and laborers on farm -----	1,000.
Salaries of machinists -----	600.
Salary of gardener -----	300.
Expense of boarding 200 pupils, at \$1.50 per week ---	14,400.
Servants for the establishment -----	2,000.
Estimated annual expense -----	23,400.
	<u>\$80,950.</u>

The Annual Receipts are computed as follows:

Board and tuition of 200 pupils, at \$150 per annum -----	\$30,000.
Produce of farm -----	4,000.
	<u>\$34,000.</u>

There was to be a department of the farm for experiments.

The committee proposed a bill to be introduced in the legislature asking for authorization to issue stock certificates to the amount of \$100,000, with interest at 5%, to be sold at auction. Three commissioners were to purchase the farm and erect buildings to accommodate 200 students, who at entrance must be at least 14 years old.

The Society presented this plan and bill to both houses of the legislature, through a committee of which Buel was a member. Favorable reports on the project were made but the legislature took no action. Then in March 1834 Buel established the monthly journal called The Cultivator, very largely as a medium of propaganda for the school. For a considerable period this paper was issued in the name of the State Agricultural Society. It circulated widely throughout the country and undoubtedly had much influence in molding public opinion on agricultural education. In general it advocated schools "in which the theory

and practice of agriculture shall constitute the paramount study", as distinguished from manual labor schools. It was also favorable to the teaching of agriculture as far as possible in the common schools and hoped that the agricultural schools would be able to prepare teachers for the lower schools. It favored but did not insist on the use of public funds for the maintenance of agricultural schools. In 1835 the legislature was again asked to charter an agricultural school without State aid. The bill passed the house with only three opposing votes but the Senate committee held it until near the end of the session and then reported it with amendments which changed its character and prevented its passage. The friends of the measure renewed their efforts and a State Agricultural Convention was held at Albany Feb. 8, 1836 at which Buel presided. This convention sent a memorial to the legislature asking for the establishment of a "School of scientific and practical agriculture". There was now evidently more favorable public opinion behind this movement, with the result that on May 6, 1836 an act to incorporate the New York State Agricultural School was passed. This provided a corporation with capital stock of \$100,000 which may be increased to \$200,000, to be used for the equipment and maintenance of a school "for the purposes of instruction in literature and science and improvement in scientific and practical agriculture and the mechanic arts." Seven commissioners, named in the act, were to receive subscriptions for the stock, interest on which was limited to 5%. No subscription was to be for more than \$1000. The corporation was to be managed by 32 trustees of whom the governor and lieutenant-governor were to be members ex-officio, the remaining members to be stockholders and citizens of the State, elected annually by the stockholders. The trustees were to purchase a farm of about 500 acres of land near the Hudson River and the City of Albany, and erect buildings thereon, and appoint the faculty and other employees of the school. "An indispensable requirement" for the faculty and students was that they should occupy one half their time during school

sessions between March and December, "either in the practical agricultural business of the farm, or in the laboratories or mechanic shops" connected with the school. The governor was required "to appoint annually a committee of three persons" to visit the school and report on its condition to the legislature.

The text of the Act is as follows:

An Act to incorporate the New York State Agricultural School.
Passed May 6, 1836.

The people of the State of New York represented in Senate and Assembly, do enact as follows:

1. William L. Marcy, John Tracy, Jesse Buel, Stephen Van Rensselaer, Henry Yates, Gideon Lee, Joab Center, John P. Beekman, Cornelius W. Lawrence, Philip Hone, Benjamin Knower, Gouverneur Ogden, Erastus Corning, James Wadsworth, David E. Evans, Hiram Pratt, Walter Cunningham, Gilbert O. Fowler, Nathaniel P. Tallmadge, Nicholas Devereux, Anthony Van Bergen, Garrit Wendell, Archibald M'Intyre, Thomas D. Burrall, John Greig, Thomas W. Olcott, Ziba A. Leland, George P. Oakley, John Delafield, Edward P. Livingston, John Townsend, Lewis F. Allen, and all such persons as now are or may hereafter become associated with them, are hereby constituted a body corporate, by the name of "The New York State Agricultural School", for the purposes of instruction in literature and science, and improvement in scientific and practical agriculture and the mechanic arts.

2. The capital stock of the said corporation shall be one hundred thousand dollars, with liberty to increase it to two hundred thousand dollars; to be divided into shares of twenty-five dollars each, which shall be considered as personal property, and be assignable in such manner as the said corporation may, in its by-laws, from time to time, provide; which said capital stock shall be exclusively devoted to the purposes and objects of the said corporation as declared in the first session of this act, and to no other purposes or objects whatever. And to the same end the said corporation shall have power to take, hold, and convey real estate to the extent of its said capital.

3. Jessue Buel, Lewis F. Allen, Henry Yates, John P. Beekman, Joab Center, Walter Cunningham and John Delafield, shall be commissioners to receive subscriptions for, and to distribute the said capital stock of the said corporation.

4. The said commissioners, or a majority of them, shall, within thirty days after the passage of this act, open a subscription book for the said stock, at such times and places as they shall appoint; and they shall give at least fourteen days' previous notice thereof in at least two of the agricultural papers in this state.

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5. At the first subscription to the capital stock of the said corporation, no subscription above one thousand dollars, by or in behalf of the same individual, shall be received. Five per cent, on each share subscribed for, shall be paid to the said commissioners at the time of making such subscription; forty-five per cent thereon when afterwards called for by them; and the remaining fifty per cent at the expiration of six months from the time of such subscription.

6. If the whole of the capital stock of the said corporation be not taken up at the first subscription thereto, the said commissioners, or a majority of them, may receive further subscriptions thereto, from time to time, until the whole capital stock of the said corporation shall be taken up.

7. The said commissioners, or a majority of them, shall, within twelve months after the passage of this act, proceed to distribute the capital stock of the said corporation among the subscribers thereto; and in case there should be subscriptions to more than the amount of such stock, it shall be the duty of such commissioners to apportion the same among the subscribers thereto, in such manner as they may deem most advantageous to the interests of the said institution, and best calculated to promote its objects.

8. The stock, property and concerns of the said corporation shall be managed by thirty-two trustees, of whom the governor and lieutenant-governor of the state, for the time being, shall always, by virtue of their offices, be two; and the remaining thirty shall be stockholders of the said corporation, and citizens of this state. They shall be elected annually, and any seven thereof shall be a quorum for the transaction of the ordinary business of the said corporation.

9. The persons named in the first section of this act shall be the first trustees of the said corporation, and shall hold their offices until the first Tuesday of February, one thousand eight hundred and thirty-seven, and until others shall be elected in their places.

10. The trustees of the said corporation for every subsequent year, except the governor and lieutenant-governor, shall be elected on the first Tuesday of February in each and every year, at such hour of the day and at such place as the trustees for the time being shall appoint, and of which they shall give public notice not less than fourteen days previous to the time of holding such election, by advertisement to be inserted in at least two of the agricultural papers in this state.

11. At every election of trustees, each stockholder shall be entitled to one vote on each share of stock owned by him, and which he shall have held for at least fourteen days next preceding such election.

12. All elections for trustees, other than the governor and lieutenant-governor, shall be held under the inspection of three stockholders, not being trustees, to be appointed previous to every election by the board of trustees for the time being. Such election shall be by ballot, and by plurality of the votes of the stockholders or their proxies then present; and the thirty persons who shall receive the greatest number of votes shall, together with the governor and lieutenant-governor for the time being, be the trustees of the said corporation; and if at any such election for trustees, two or more persons shall have an equal number of votes, then the trustees who shall have been duly elected, shall proceed by ballot, and by plurality of votes, to determine which of the said persons, so having an equal number of votes, shall be trustee or trustees, so as to complete the whole number.

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13. If any trustee of the said corporation, other than the governor or lieutenant-governor, shall cease to be a stockholder thereof, or shall remove out of the state, his office shall thereby become vacant; and whenever any vacancy shall happen among the trustees, such vacancy shall be filled for the remainder of the year, in which it shall so happen, by such person possessing the qualifications above required for trustee of this corporation, as the remaining trustees for the time being, or a majority of them, shall appoint.

14. The trustees of said corporation, as soon as may be after their appointment or election under this act, shall, in like manner, proceed to elect, of their number, a president, two vice-presidents, a treasurer, recording secretary and corresponding secretary, who shall respectively hold their offices for one year, and until others are elected in their places. They shall also appoint such professors, teachers, agents, and other persons as may be necessary to conduct the proper business, and accomplish the declared objects of the said corporation.

15. The said trustees shall, as soon as may be, proceed to purchase a farm of about five hundred acres of land, either contiguous to, or near the Hudson River, and as nigh to the city of Albany as may be convenient; and shall cause to be erected thereon such buildings as may be suitable and necessary, and make all such other arrangements as may be proper for the future business of the said corporation, and for the accomplishment of its objects.

16. The said corporation in exercising its power of making by-laws for its own government, shall make it an indispensable requirement that the professors, teachers, and pupils of the school hereby intended to be authorized and established, shall, unless prevented by sickness or other reasonable cause, occupy themselves for at least one-half of the time the said school is in session, between the months of March and December, either in the practical agricultural business of the farm, or in the laboratories or mechanic shops connected with said school.

17. The said corporation shall in no case, out of the profits arising from its business, declare and make a dividend of more than five per cent per annum, upon its actual incorporated capital paid in and possessed; and if at any time, after the payment of such dividend, there shall remain any surplus of such profits, it shall be expended in additions or improvements to the farm, buildings, library, apparatus, or other necessary establishments connected with the said institution, or in reducing the price of tuition at the same.

18. The governor shall appoint annually a committee of three persons, whose duty it shall be to visit the said institution, and to report the condition thereof to the legislature at the commencement of its next session. The members of the said committee shall receive no compensation for their services under this act, but their reasonable expenses shall be paid by the said corporation.

19. The corporation hereby created shall be subject to the provisions of the eighteenth chapter of the first part of the Revised Statutes, so far as the same are applicable, and have not been modified or repealed.

20. This act shall take effect immediately after the passage thereof.

The commissioners named in this act, of whom Buel was the chairman, made an active effort to secure subscriptions to the stock of the school but with disheartening results.

At the State agricultural convention in February 1837, attended by 150 men from 40 counties, a petition was sent to the legislature asking for an appropriation for the agricultural school to be used for "purchase of library, apparatus, etc." In the Cultivator of that year was an article by Dr. J. P. Beekman, a prominent member of the State Agricultural Society and of the school corporation, showing "the kinds of instruction which it is intended shall be given in the contemplated school of agriculture." The subjects are to include mathematics, chemistry (with doctrine of manures), geology, mineralogy, botany and entomology. "The principles of industry are to be instilled and the most regular and systematic manner of farming practiced." "Suppose such an institution to contain 200 students and a course of studies to last 3 years, it would send each year nearly 70 young men so educated into the different sections of the State. Their knowledge of theoretical and practical farming would be generally diffused; and continuing this number for many successive years, it would give thousands of the best farmers, scattering them through every portion of the State."

At the State Agricultural Convention in February 1838, Buel urges the establishment of agricultural schools and attempts to refute the objection that they would be for the rich. At that convention a committee on the use of public funds for agriculture favored schools but thought a board of agriculture with branch county societies of more immediate importance. However, the committee reported resolutions for appropriations for (1) a board of agriculture, (2) county agricultural societies and (3)

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a State agricultural school or schools. The first two were adopted unanimously. The third was extensively debated but finally adopted "almost unanimously." On this basis the convention voted to send a memorial to the legislature.

The Cultivator in 1838 contained a long article by D. Jay Browne, giving a plan for an agricultural school.

"The chief objects of the school should be to form practical mechanics, civil engineers, operative chemists, veterinary surgeons, and practical agriculturists. It should be endowed with six professorships in the following subjects:

- 1 - Mathematics and design.
- 2 - Rural architecture and civil engineering.
- 3 - Natural philosophy and practical mechanics.
- 4 - Geology, mineralogy and chemistry.
- 5 - Entomology, botany and practical husbandry.
- 6 - Comparative anatomy and the veterinary art."

Preparatory studies should be reading, writing, English grammar, common arithmetic, geography and bookkeeping by single entry. No pupil should be under 17 years of age. There should be general and special instruction.

Under general instruction covering two years the students should participate in laboratory and farm work and botanical and geological excursions.

Under special instruction covering the third year the students should be actively engaged in the business they intend to pursue and should have daily conferences with the professors. The school should have a library, apparatus, collections, different breeds of animals, a **with buildings** large farm (principally built by students who would also receive instruction in farm operations), spacious laboratories and shops.

A circular issued in 1838, inviting subscriptions to the stock of the school was signed by W. H. Seward and W. L. Marcy, as well as Buel and Beekman. In December of that year Buel published in the Cultivator what is perhaps his final discussion "on the utility of agricultural schools." His summary is as follows:

- 1 - That science has become important, if not essential, to the successful prosecution of the arts of labor.
- 2 - That a knowledge of many of its principles is particularly necessary for the improvement of agriculture.
- 3 - That the theory and practice - science and art - when made companions reciprocally aid and improve each other; and hence
- 4 - That the best way of promoting useful improvements in both is to blend them together in schools of instruction - to teach the science and the art simultaneously to those who are destined to manage the productive labors of our country.

In his discussion of this matter Buel quotes from Edward Everett's "Essay on the Importance of Scientific Knowledge" in which it is stated that while at that time the teaching of science was confined to colleges for professional preparation, mechanics, navigators and those conducting large agricultural and manufacturing establishments should have knowledge of principles relating to their work, including among many other things "composition and improvement of soils."

The outlook for the agricultural school grew more and more discouraging. Public interest in education was for the time being largely centered on the improvement of the common schools as the result of the movement inspired by Horace Mann. Apparently for this reason, Buel toward the close of his life laid more stress in his public utterances on the importance of teaching subjects relating to agriculture in the lower schools.

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However, the State Agricultural Society continued its efforts to promote agricultural education. In the New York Assembly in 1839 a committee had before it 80 petitions for aid to agriculture, with nearly 6000 signatures. The committee in its report expressed surprise "that there is no school, no seminary, no sub-division of any school, in which the science of agriculture is taught", though this is "a business which occupies eight-tenths of our population", and recommended that an agricultural school be established.

In 1840 the assembly committee on agriculture urged that the legislature should promote the science of agriculture with as much liberality as it does with reference to literary institutions.

The act of May 5, 1841, under which the State Agricultural Society was reorganized greatly strengthened it and through its series of publications enabled it to give more prominence to its efforts for agricultural education. (404) In 1842 the Society published an article on agricultural education by A. S. Wynkoop and that year the legislature considered a proposition to establish agricultural schools in each county. In 1843 many petitions to the legislature were again prepared and at its ensuing session the assembly committee reported that if the State was to give further funds to benefit agriculture "it should be to endow a college for the purpose of disseminating scientific knowledge of agriculture throughout the State." There was also in 1844 another report which recommended an appropriation for public lectures on practical and scientific agriculture in different parts of the State. The chairman of this committee was Dr. Daniel Lee, editor of the Genesee Farmer, who for years went about the state delivering lectures on agricultural chemistry and advocating an agricultural college. (p. 184)

In the session of the legislature in 1844 and 1845 he secured the passage in the assembly of a bill to establish an agricultural college and in 1845 this bill came within one vote of passing the Senate.

~~1846~~

In 1846 the American Institute of New York City asked the legislature to establish under its auspices an agricultural college near New York City. ⁽³⁶⁵⁾ The Institute had been organized in 1828 to promote the interests of agriculture, commerce, manufactures and arts through fairs and exhibitions. It had a Farmers' Club, which was quite active.

In their petition to the legislature they stated that they had professors in various departments and wanted state aid to organize an agricultural department. James J. Mapes was their professor of natural philosophy and chemistry and gave considerable attention to agricultural chemistry. Later he became a manufacturer of commercial fertilizers and editor of the "Working Farmer". The Institute's petition was referred to a special committee which ⁽³⁶⁶⁾ on April 24, 1847 made a favorable report. With this report was a bill "to authorize the American Institute of the City of New York to establish an agricultural and scientific school, with an experiment farm at a convenient distance from New York City, in which should be taught the theoretical and practical science of agriculture and the sciences connected therewith, under a Board of Agriculture of the American Institute of five persons, the school to be subject to visitation of the regents of the university as are colleges. When the school was organized and farm purchased a state appropriation was to follow."

In explaining the purpose of the school the committee stated:

"Its primary, but not exclusive, object should be to impart a theoretical and practical knowledge of husbandry, including agricultural chemistry, plant physiology and soil analysis.

An agricultural school should be more liberal and enlarged in its course of instruction and not inferior in point of intellectual requisition and celebrity to the boasted seats of classical and mathematical literature. French, Spanish and German, elocution, composition, chemistry, geology, botany, natural history of beneficial and noxious animals, arithmetic, algebra, geometry, trigonometry, surveying, civil engineering, natural philosophy, astronomy, physics, animal pathology and veterinary medicine should be taught as well as general principles of farming and horticulture, arrangement and superintendence of farms, and bookkeeping.

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An experimental farm of not less than 200 acres should be under the superintendence of a scientific and practical farmer.

A matron should be in charge of the household and dairy department. The time of the pupils should be divided between manual farm labor and study.

On the farm implements should be tested. There should be a workshop for students to make implements. Livestock of different kinds, domestic and foreign, and an agricultural museum of soils, plants, animals, etc. (366)

On May 5, 1847 the Assembly committee on agriculture brought in an adverse report on this matter but favored the teaching of agriculture in

(367)

normal schools, academies and common schools. ^ On September 11, 1847, the

former committee again reported in favor of the Institute's plan, enlarged to

(368)

include a school for both agriculture and mechanic arts. ^ This committee at-

tempted to offset the objections urged by the committee on agriculture and

favored a loan of \$25,000 of State funds to the Institute.

Under Mechanic Arts there should be instruction and experiments because they would lead "to useful discoveries and inventions". In an address of the president of the Institute in 1850 there is reference to a provisional agreement for the purchase by the State of a farm of about 150 acres at Morrisania for \$21,000 for an agricultural school and for education in civil engineering, surveying and "the mechanical and industrial pursuits of common life." The legislature, however, refused to take favorable action on the Institute's proposition.

Meanwhile the State Agricultural Society was discussing what it should do further for agricultural education and there was some difference of opinion as to whether a separate institution or department of agriculture in existing colleges was the better plan. By 1849 the Society had decided to ask the legislature to establish an agricultural college and this was advocated by Governor Hamilton Fish in his message that year. By concurrent resolution adopted April 6, 1849, a commission was appointed to consider the propositions for agricultural education. In submitting their report in 1850 the governor referred to differences of opinion regarding details but said "I most earnestly

hope no such differences and no other cause may prevent the establishment and the endowment upon a wise and comprehensive system, of an institution so beneficial in its design and so promising of enduring and beneficial results, as a school of instruction in practical and scientific agriculture and in the mechanic arts." The commission made a detailed report and submitted a bill for the establishment of the agricultural college of the State of New York. The legislature that year also had before it memorials for an agricultural department at the Genesee College and for agricultural schools in each of several districts in the State. (371)

In 1851 the Assembly committee on agriculture again reported in favor of an agricultural college. (374) It also agreed that a mechanical school or college would be a good thing but did not favor its attachment to an agricultural college. The mechanical college should be in a large city or village.

The committee stated its belief that since this matter had been so long under consideration and the petitions relating to it were so numerous "the great mass of the agricultural community throughout the State demands the establishment" of an agricultural college and therefore it should be "endowed by the State and be considered a State institution." The recommendation was for a "college and farm of 60 acres cultivated by students working four hours a day, and instructed in the raising of plants and animals; the proper time to sell produce and how to put it in market; the manner of keeping farm accounts and farm management; chemistry, natural philosophy, geography, mineralogy, botany, horticulture, veterinary medicine, land measurement, drainage, irrigation, farm implements and buildings and rural laws, together with higher departments of English education.

For admission - English, grammar, geography, arithmetic.

Age of entrants - 16 years.

Faculty - President, six professors, farm superintendent, gardener, carpenter, mason, blacksmith."

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It was thought an annual appropriation of \$10,000 would provide for the current expenses of the school, when taken together with money obtained from students and sales of farm products.

A minority report stated that both farmers and laboring men are opposed to such institutions which would involve large expenditures without corresponding benefit and lead to favoritism and corruption. (376) The bill that year failed by a narrow margin. The matter came up again in the legislature in 1852 with the same result.

Meanwhile the State Agricultural Society had been actively supporting this measure and had given publicity to addresses and other material favoring an agricultural college. A new leader had arisen in the person of John Delafield (1786-1853), who was made president of the Society in 1851 and in his annual address in January, 1852, discussed "The need of an agricultural college". (5) He was born in New York City, graduated at Columbia College in 1802, engaged in mercantile pursuits, was for a time a banker in London and afterwards in New York and was instrumental in founding the University of New York. His interest in agricultural education at an early day was shown by the inclusion of his name in the list of incorporators in the Act of May 6, 1836, for the first New York State Agricultural School.

In 1842 he settled on a farm at Fayette (near Geneva), in Seneca County, New York, not far from the farm of the famous Scotch farmer, John Johnston, who introduced tile-draining into this country, and doubtless influenced Delafield to import the first tile-making machine. He had made an agricultural survey of Seneca County, a report of which was published by the State Agricultural Society in 1850. In 1847 he was elected president of the Seneca County Agricultural Society. At the time of his death it was said by an associate in that Society that in the face of continued neglect of the agricultural college project by the State Delafield was "resolved to carry through this important enterprise by personal effort and to secure, if possible, the location of so important an institution" in Seneca County.

With the backing of the State Agricultural Society and other friends of agricultural education Delafield secured an act of incorporation for the New York State Agricultural College on April 15, 1853. Three days earlier the friends of a college which should include mechanic arts together with agriculture and other subjects, had secured a charter for "The People's College for the purpose of promoting literature, science, arts and agriculture." From this time on to the establishment of Cornell University the streams of influence relating to higher education in agriculture and other industries under State patronage were distinctly divided as we shall see by following the history of the New York State Agricultural College and the People's College.

New York State Agricultural College.

The act of April 15, 1853 incorporating the New York State Agricultural College reads as follows:

"The people of the State of New York, represented in Senate and Assembly, do enact as follows:

1. John Delafield, Henry Wager, B. P. Johnson, William Kelly, John A. King, N. B. Kidder, Joel W. Bacon, William Buel, Tallmadge Delafield, Robert J. Swan, and such other persons as shall or may be associated with them for that purpose, are hereby constituted and created a body politic and corporate by the name, style and description of the 'New York State Agricultural College', and the said corporation shall have and enjoy all the corporate rights and privileges enjoyed by an incorporated college in the State of New York, and shall be subject to the provisions and exercise the powers and duties contained and set forth in the second article of the fifteenth chapter, title one, of the revised statutes.

2. The farm and grounds belonging and attached to the said college shall consist of not less than three hundred acres.

3. The plan of instruction shall embrace the following branches of knowledge; practical and scientific agriculture, chemistry and its manipulations so far as it may be usefully connected with agriculture, mathematics and mechanics, surveying and engineering, geology and botany, the practical management of the farm, of the dairy, and of the various kinds of live stock; also such other branches of knowledge as may be deemed useful and proper.

4. The persons named in the first section of this act shall be and form the first board of trustees.

5. This act shall take effect immediately."

The trustees named in this act very soon organized the college and elected Mr. Delafield president and appointed a committee on its location.

This committee reported in favor of Mr. Delafield's farm known as Oaklands. Arrangements were made to obtain subscriptions to the capital stock of the institution. Little had been accomplished when the sudden death of Mr. Delafield, October 22, 1853, put an end to this enterprise.

The next move was made by the Academy at Ovid under the leadership of Rev. Amos Brown (1804-1874). He was born at Kensington, N. H., and spent his early boyhood on a farm. He graduated at Dartmouth College in 1832 and then studied at the Andover (Mass.) Theological Seminary. As principal of academies at Fryeburg and Gorham, Maine, he showed marked success as a teacher and organizer. Afterwards he was for a time pastor in a Congregational Church at Machias, Maine. In 1852 he went to Ovid, New York, and became principal of the Academy there. This school had been chartered in 1826 and when Brown came to it had very few students. He persuaded the trustees "to provide by subscription the salary of one teacher, who was to give instruction in the school in Chemistry, Agricultural Chemistry and Botany, and was to deliver lectures on these and kindred subjects to which the subscribers, with their families were to be admitted free of further charge." (Brewer - Ms., letter to Hewett. See below)

William H. Brewer, who had spent two years in the Yale Scientific School, studying chemistry, agriculture and other sciences under Professors Silliman and Norton, was appointed under this agreement.

Six teachers were employed and the school prospered greatly. Within the next six years a considerable number of students were prepared for college. Among these students who afterward achieved notable success as educators were Professors Morris of Cornell University, Doolittle of Rutgers College and Lounsbury of Yale College, and President Folwell of the University of Minnesota.

Mr. Brewer gave the winter lectures which were open to the public. Regarding these he says in a letter to Prof. W. T. Hewett of Cornell University, March 11, 1894 (copy in Office of Experiment Stations) - "Until we had suitable

rooms in the Academy itself they were given in the Court House, and that large hall was generally filled and often crowded. These lectures were an important factor in bringing the matter of scientific instruction for practical ends prominently before the people round about and was a sowing of seed for the growth of the future Agricultural College."

The old academy building was soon too small to accommodate the students and Mr. Brown raised money for a larger additional building, dedicated August 1, 1855, with elaborate exercises, including an address on the Agricultural College, which for some time Mr. Brown had desired to connect with the academy. Immediately after this Mr. Brewer went to Europe, where he studied chemistry, geology and botany at several universities, under such men as Bunsen, Liebig and Wagner, with the understanding that on his return he would be professor of agricultural chemistry at the Agricultural College if it came to Ovid. This plan was not carried out.

Some time before this the name of the Ovid Academy had been changed to the Seneca Collegiate Institute.

Mr. Brown undertook an active propaganda to secure a loan from the State to enable the State Agricultural College to begin operations. With the aid of the trustees of the college, members of the State Agricultural Society including Samuel Cheever, its president, and others, he secured the support of Governor Clark and obtained from the legislature an act of March 31, 1856, which granted a loan of \$40,000 of state funds for 21 years without interest, on condition that an equal amount was raised by subscription, and a site for the college secured in Seneca County, with a farm of 300 acres. Largely through Mr. Brown's efforts \$47,000 was raised by subscription. The trustees of the college, who had held over after Mr. Delafield's death, became very active and purchased farms aggregating 686 acres. Opponents of Mr. Brown, who was not always wise in his activities, succeeded when the board met in July, 1857, in preventing him from

becoming president of the new college, but he remained in charge of the Seneca Collegiate Institute until the end of the school year 1857-58. Meanwhile he obtained the presidency of the People's College. Mr. Brewer came back from Europe in September 1857 and returned to teaching in the institute with the understanding that he would become professor of agricultural chemistry and botany in the college. At the end of the school year he accepted a temporary position as professor of chemistry and geology in Washington College, Pennsylvania, intending to return to Ovid when the college there opened but owing to objections to the policy of the trustees he resigned in the fall of 1860.

The affairs of the Agricultural College were handled by a committee of the trustees until the spring of 1858 when Judge Samuel Cheever was elected president. He was not suited to the place and resigned January 30, 1859, after which a committee again took charge until September 23 of that year when Major M. R. Patrick, a graduate of West Point, was elected. Provision was made for professors of chemistry, mathematics, philosophy and astronomy. A course was planned covering 3 years, divided into 2 terms from April 15 to November 1 and from December 1 to March 1. It included intellectual and moral philosophy, English language and literature, constitution of the United States and New York, laws relating to contracts, highways, fences, etc., natural sciences, mathematics, surveying, drawing, book-keeping, construction of roads, bridges, fences, etc., besides the applications of these subjects to agriculture, instruction in veterinary medicine, farm implements, machinery and buildings, and practical exercises in field crops, horticulture, animal husbandry and farm engineering.

A college building had been partially erected when the college opened December 5, 1860. Twenty-seven young men were in attendance during the winter. The Civil War broke out before the end of the school year and Major Patrick went into the army. The school was closed and efforts to reopen it in later years did not succeed. Ultimately the State was forced to take over the farm and buildings and they were used for an asylum for the insane.

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The People's College

The plan which ultimately resulted in the organization of the People's College was originated by Harrison Howard, a mechanic residing at Lockport, New York. He was a member of the organization commonly called the Mechanics Mutual Protection. In his account of this organization ⁽³⁵²⁾ Howard says that after the panic of 1837 there was much discussion regarding measures for solving the labor problem. One result of this condition was the holding of a convention of mechanics at Buffalo, New York, July 13, 1843, at which was organized the "Right Worthy Mechanics Grand Mutual Protection", having as its object "to raise the mechanics of America to their true position in society." This was to be attained by (1) "a more general diffusion of the principles and sciences governing mechanics and the arts, to elevate our brethren in their varied capacities and thereby give them the greatest proficiency in their several callings;" (2) by extending to apprentices a good education; (3) by mutual help in sickness and to families and by furnishing employment, and (4) by cultivating a proper understanding between employees and employed. This organization soon established numerous branches in different parts of New York and in several other States.

Previous to this Howard had become interested in education for mechanics and had studied the manual labor schools, through such works as Weld's Report as agent of the Manual Labor School Society in 1832, the Manual Labor Journal, Henry Colman's reports on agriculture and technical schools in Europe and Woodbridge's Annals of Education. He became convinced that the manual labor schools were failing because they made labor drudgery. Gradually he formed a plan to "establish mechanical schools for the promulgation of the economic arts similar to those of other professions, with the exception of sup-
⁽³⁵¹⁾porting the institution with the labor of its students." [^] To accomplish this there should be a "Mechanical Society" with branches in each county, with one

or more travelling agents to form societies, get subscriptions, etc. As soon as possible a charter should be obtained for a school in which "there should be taught natural philosophy, chemistry, geometry, architecture, drawing, etc., not neglecting any other branches taught in our best colleges and universities." A fund of \$100,000 should be raised by dollar subscriptions from mechanics, of whom there were thought to be about 125,000 in New York.

This plan was submitted first to the local organization of the Mechanics Mutual Protection at Lockport, and afterwards to the State organization in December 1849. "The plan proposed to combine labor with study and improvement in manual skill with intellectual culture - to have in time a Mechanics' Institute, or Seminary in every county or senate district, but in the first effort to establish one central or State College of Practical Science, wherein our youth, aspiring to efficiency and eminence in life as architects, engineers or artisans of any sort, might receive a thorough physical and mental training, laboring a part of the day and thus paying at first a part and afterward for the whole of subsistence and teaching."

When this plan was published it attracted the attention of Horace Greeley, who in an editorial in the New York Tribune of May 9, 1850, approved it but said that "this university should embrace agricultural as well as mechanical instruction and the farmers should be invited to cooperate in founding it. It should have a square mile of land - a part of it very good - or capable of being made so - and this should be made in time the model farm of the State and its nursery and seeds should hold the first rank in the public estimation." Howard and his followers gladly assented to this proposition whereupon Greeley actively supported the movement, became a member of the association formed to promote it and later a trustee of the college.

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Before his election in 1850 Governor Washington Hunt was led to endorse this project and in his first message to the legislature he said "the beneficial effects of an agricultural and mechanical school will not be limited to the individuals who may participate in its privileges." The graduates will become teachers "imparting to those around them the light of their own intelligence."

An organization called the People's College Association was formed at Lockport, August 12, 1851, and after several meetings adopted a Prospectus of People's College. This institution was "to minister to the educational wants of the youth of the whole people" by "the dissemination of practical science, including chemistry, geology, mineralogy and those sciences most immediately and vitally essential to agriculture and the useful arts, though instruction in the classics shall be amply provided." "Every pupil and every teacher shall be required to devote some hours in each of five days in each week to bona fide useful labor in some branch of productive industry." "Agriculture with the various branches of manufactures and the mechanic arts shall be systematically presented and no student allowed to graduate without examination in agriculture or mechanicarts." (406)

Women were to be admitted and instruction provided for them in house-keeping, dressmaking, fine needlework, etc.

This prospectus had been drawn up by Greeley and sent to Howard and T. C. Peters for revision. Peters, an influential member of the State agricultural Society, its president in 1865 and editor of the Wool-Grower, had previously approved the project and later as a member of the legislature did much to secure a charter for the college. A meeting of the Association to discuss the prospectus was called at Buffalo, Jan. 15, 1852, when a severe snowstorm prevented the attendance of the members, except Howard. He appointed Greeley and Peters to memorialize the legislature for a charter. At a meeting at Rochester resolutions reported by Greeley and adopted set forth that "it is eminently desirable that a

People's College be established in this State subject to the control of no sect or party, wherein productive labor shall be practically honored and inflexibly required of all" and that an agent be appointed to get members of the association and subscriptions for the endowment of the college. A promotion committee consisting of persons from every county was appointed.

Ladies, including Lucy Stone, were present at one meeting at least of the Association in order to make sure that women were to have equal privileges with men in the college. The admission of negroes was also favored. In the charter obtained there is no reference to either of these matters.

Howard was appointed field agent of the Association and many meetings were held in different parts of the State. These were attended by many prominent persons, including Henry Ward Beecher and Professor Youmans at a meeting in Brooklyn. Influential politicians, including W. H. Seward and Martin Van Buren, became members of the association.

A meeting of the association was held at Albany Jan. 12, 1853, and on February 18 of that year the bill for a charter for the college was reported favorably in the Assembly by the Committee on Agriculture of which Mr. Peters (381) was a member. A minority of the committee, however, opposed the bill on the ground that existing institutions were giving instruction in practical sciences (380) and other subjects which would be taught in this college. They were also against coeducation.

The bill as passed April 12, 1853, incorporated "the People's College (407) for the purpose of promoting literature, science, arts and agriculture." The capital stock was to be \$250,000, which might be increased to \$500,000. When \$50,000 was subscribed and paid the trustees were to locate the college. The faculty was to be chosen as soon as accommodations for at least 100 students were provided. The instruction was in general to follow the plan outlined in the prospectus quoted above.

"The said corporation may grant to students, under its charge, diplomas and honorary testimonials, in such form as it may designate; but such diploma or honorary testimonial shall expressly specify the branches which the student has mastered, and those only. It may also confer such literary honors, degrees and diplomas as are usually conferred by any university, college, or seminary of learning in the United States, which diplomas shall entitle the possessors thereof to the immunities and privileges allowed by usage or statute to the possessors of like diplomas from any university, college or seminary of learning in the state; provided, that no diploma shall be conferred, but in conformity with the laws of the state in force at the time of conferring the same.

6. The capital stock of said corporation shall consist of two hundred and fifty thousand dollars, which may be increased by a majority of the trustees, from time to time, to five hundred thousand dollars; the said stock shall be in shares of one dollar each, and every stockholder shall be entitled to but one in the choice of trustees, or any other business which may be determined by the votes of the stockholders.

8. As soon as suitable accommodations are prepared for at least one hundred students, the said trustees shall organize the faculty of the said college by appointing a president, professors, teachers and other officers. It shall be the duty of the said trustees to so arrange the business, and courses of instruction in said colleges, as to accomplish in the best possible manner:

1. The dissemination of practical science, including chemistry, geology, mineralogy, and those sciences most immediately and vitally essentially to agriculture and the useful arts, and to make ample provision for instruction in the classics.

2. To require that every pupil and teacher shall devote some hours, each of five days in each week (excluding Sunday for worship and Saturday for recreation), to bona fide useful labor in some branch of productive industry. The number of hours, however, which such student and teacher shall be required to labor, in each week, shall in no case exceed twenty nor fall below ten; and each student shall be credited with and ultimately paid for the product of his labor, less the cost of qualifying him to perform it effectively.

3. To have agriculture, with the various branches of manufactures and the mechanic arts, systematically prosecuted within the bounds of the college and its grounds, and as a part of its regular course; and no student shall be permitted to graduate with honor until he pass a searching examination with regard to his proficiency in agriculture or some branch of manufacturing or mechanical industry; and every student shall be allowed (with the advice and consent of his parents and guardians, and the faculty) to pursue such branches of learning as he may select, but the faculty shall implicitly require from each student a thorough mastery of those he may choose to follow, which shall be expressed in his diploma; and any student under this condition may prosecute his studies for so many terms only as he, under parental guidance, may be deemed expedient.

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4. These several foregoing subsections may be amended at all times by a majority vote of the stockholders, except that the fundamental principles of finding work for and requiring of each pupil and teacher at least ten hours bona fide useful labor per week, and an earnest effort to master some industrial pursuit, shall be held irrevocable, except by a vote of all the stockholders, taken by ayes and nays, and the names of those voting duly recorded. (5 and 407)

On April 20, 1853, trustees of the college were selected and a committee of which Greeley was chairman was appointed to outline a plan of studies and labor, which was discussed at great length. At a later meeting Greeley was appointed to draft an address to the public for circulation throughout the State.

Propaganda in the interest of the College became extremely active. Howard as field agent reported Nov. 24, 1853, that during that year he had visited 20 counties, addresses had been delivered by different men in more than 200 places, 25,000 copies of a pamphlet describing the project had been distributed and the press had been aroused to a lively interest.

Subscriptions to the stock, however, went on slowly and it was not until 1856 that Mr. Charles Cook, of Havana (now Montour Falls), Schuyler County, made a proposition to make up the remainder of the \$50,000 required for the location of the College. He offered a farm and indicated that he would also make a liberal contribution of money. The stockholders met at Havana, early in January, 1857, and when 2,984 votes had been cast in person and by proxy, Havana was selected by a majority of 710 votes as the place for the location of the College. At Havana April 14, 1857, Peters reported that the legislature had approved this location and on motion of Greeley five trustees were appointed to locate and begin erection of buildings, together with committees on the agricultural interests of the college and on the curriculum and selection of faculty.

(p. 221)

In August, 1857, Amos Brown[^] was elected president of the College and Mr. Cook was made chairman of the executive committee and of the building

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committee. "The financial crisis of 1857 destroyed all hope of raising the necessary funds by popular subscription." For a time the hope of the passage of the land-grant bill introduced in Congress by Mr. Morrill in 1857 and strenuously worked for by Mr. Brown who went to Washington for that purpose, encouraged the friends of the College but in this they were disappointed by President Buchanan's veto of this measure.

Meanwhile the erection of the College building went on and on September 22, 1858 the corner stone was laid in the presence of an audience variously estimated as including 8,000 to 15,000 people. Mr. Cook presided and President Brown made (408) "a brief exposition of the plans and purposes of the college". ^ It will be more easily accessible to youth "on pecuniary grounds" and also because "while the discipline of the mind and instruction in the sciences and letters will be here properly cared for, the applications of the sciences to the arts will be particularly attended to; thus making the college both a disciplinary and professional institution."

Among the objects are (1) "to so arrange the exercises of the students as to qualify them upon graduation to enter at once upon the business of their choice, by giving not only a theoretic, but a full, systematic practical course of instruction, illustrative of the principles and laws upon which their business is based and should be considered"; (2) to make the farm and workshop models "so that visitors may receive useful hints in respect to their various avocations" and (3) to have collections of the "finest specimens of mechanisms, the choicest varieties of fruits, grapes, roots, etc. and the best machines and implements adapted to mechanical and agricultural industry." "It is not yet quite determined what connection shall subsist between the college as a literary institution and as an institution to answer the second purpose of its founders to facilitate the rewards of industry, etc." Agents may be chosen

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to run the industries at their own expense and risk in the college buildings.

Mark Hopkins, president of Williams College, made an address in which he said there were too many colleges poorly endowed. He favored an institution for liberal and professional education because of "the vast extension of the physical sciences within the last 50 years and from their intimate connection with the business and enjoyment and progress of society."

He "should expect that an education in which physical science and its practical application, rather than classical learning or metaphysical study, should be the predominating idea, would in some respects be superior to that given in our colleges." It would tend to quicken and improve the powers of observation. Improvement may also come "from combination of physical and mental labor." This, however, "presents a problem not yet solved."

In his address Horace Greeley said, "We want a seminary which provides as fully and thoroughly for the education of the 'Captains of industry', as Yale or Harvard does for those dedicated to either of the professions". He also pleaded for justice to women in education.

President Brown began making arrangements for a faculty and at one time had a tentative agreement with Professors Brewer and Folwell that they would be professors in People's College. In 1860 Mr. Cook was still contemplating a gift of a large sum to the college. Building proceeded until about \$70,000 had been spent, of which Mr. Cook gave about \$56,000. Mr. Cook became a member of the State Senate and in April 1862 the legislature appropriated to the college \$10,000 a year for 2 years, "but on technical grounds the controller refused to pay this sum."

When the Federal land-grant act passed in 1862, great effort was made to secure its benefits for the college and largely through the efforts of Mr. Cook and President Brown an act to this effect was passed by the legislature May 14, 1863. "It made conditions, however, that the trustees should show to the satisfaction of the regents of the University of the State of New York within 3 years, that the

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college was provided with a certain number of professors, buildings and accommodations." The college could not meet these conditions and this enterprise came to an end. (See p. 494)

The buildings were used for a time for a masonic school and orphan asylum.

In 1872, Elbert W. Cook, a younger brother of Charles Cook, turned over to the Baptist State Convention the main building and 40 acres of land of People's College, together with over \$40,000 endowment, to establish Cook Academy. The school was chartered with a board of trustees and opened for students September 17, 1873. It has prospered and in 1925 was maintained as a standard secondary school, serving also as a high school for the village of Montour Falls.

VIRGINIA

Plan for Professorship of Agriculture in University of Virginia.

As early as 1800 Jefferson had included agriculture in the list of sciences to be taught in the University which he hoped would soon be established in Virginia and in 1814 his plan for a university included a school of rural economy. (53) When the act for a university was passed in 1818 it was for an institution "wherein all branches of useful science were to be taught." Then Jefferson, as president of the board, established under this act to locate the university and provide for its operation, in a report to the legislature, stated that among the objects of higher education is the function "to harmonize and promote the interests of agriculture, manufactures and commerce."

At a meeting of the Albemarle Agricultural Society, October 7, 1822, on motion of Gen. John H. Cocke, resolutions were adopted favoring the establishment of a fund, the income of which would be used to support a professorship of agriculture in the university of Virginia. (517) The society pledged \$1,000 for this purpose and invited the cooperation of the other agricultural societies in the State. Madison, as president of the Albemarle Society, prepared an address to them and a committee to solicit donations from individuals was appointed. In Madison's letter to the societies were the following statements:

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"to the due success of agriculture, as of other arts, theory and practice are both requisite. * * * A professorship of agriculture might derive special advantage from the lights thrown out from the chair of chemistry in that institution. * * * It will be an improvement of the plan of agricultural instruction, to provide and place under the superintendence of the Professor, a small farm in the vicinage, to be cultivated partly as a pattern farm, illustrating practically a system at once profitable and improving, partly as an experimental farm, not only bringing to the test new modes of culture and management but introducing new plants and animals deemed worthy of experiment." (505)

This appeal met with very little response and the professorship of agriculture was not provided for when the University opened in 1825. Agriculture was not definitely recognized in the University organization until 1867 when as an adjunct to the school of chemistry, the school of technology and agricultural science was created, but its name was soon changed to school of analytical, industrial and agricultural chemistry. In 1870 a school of scientific, experimental and practical agriculture was established and afterwards this was called a school of agriculture, zoology and botany.

Michigan

University of Michigan

The first attempt to establish a State University in Michigan was made in 1817 when the territorial legislature passed an act creating the "Catholepistemiad or University of Michigania." The plan of this institution was devised by Judge A. B. Woodward of the Supreme Court of the territory, a friend and appointee of Jefferson. It was of French origin as is indicated by the strange nomenclature used in describing the proposed organization of the University. It was to be supported by special taxes and lotteries. The University authorities were empowered not only to manage the central institution but also "to establish colleges, academies, schools, libraries, museums, botanic gardens, laboratories, and other useful literary and scientific institutions" and to appoint teachers and other school officers in all the counties, towns and cities of the territory. In 1821 this law was revised and a University

of Michigan was created with a board of trustees to manage all the schools which might be organized within it. What little was done under these laws related to the lower schools for the time was not ripe for the establishment of an institution of higher learning under state control.

In a constitution framed to create the State of Michigan and ratified by the people November 2, 1835, article 10 provided for the appointment of a superintendent of public instruction, directed the legislature to "encourage by all suitable means, the promotion of intellectual, scientific, and agricultural improvement", including a system of common schools and township libraries, created a perpetual fund for the support of schools from the proceeds of land-grants from the United States and in Section 5 directed that

"The legislature shall take measures for the protection, improvement, or other disposition of such lands as have been or may hereafter be reserved or granted by the United States to this State for the support of a university, and the funds accruing from the rents or sale of such lands, or from any other source, for the purpose aforesaid, shall be and remain a permanent fund for the support of said university, with such branches as the public convenience may hereafter demand for the promotion of literature, the arts and sciences, and as may be authorized by the terms of such grant. And it shall be the duty of the legislature, as soon as may be, to provide effectual means for the improvement and permanent security of the funds of said university."

This article was drafted by General Isaac Edwin Crary, a native of Connecticut and graduate of Trinity College, who was chairman of the committee of Education in the Michigan Constitutional convention. (271) He had been for several years a resident of Marshall, Mich., where he had been inclosed touch with John Davis Pierce, a native of New Hampshire and graduate of Brown University and Princeton theological school. These men were deeply interested in education and had been greatly impressed with the account of European systems of education in Victor Cousin's Report on the State of Public Instruction, which in some way had reached them soon after its publication.

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Mr. Pierce was appointed by Governor Mason as the first State Superintendent of Public Instruction and directed to prepare a plan for a system of common schools and a State University. He held this office six years and rendered very important service. Under his guidance the legislature passed the act of March 18, 1837 establishing the University of Michigan as an integral part of the public school system of the State. The University was to be divided into three departments: (1) Literature, Science and the Arts, including instruction in "practical farming and agriculture"; (2) Law and (3) Medicine. The Board of Regents were to establish branch schools in different parts of the State whenever the legislature authorized their creation. In these branches in addition to other studies in preparation for the University, there was to be "a department of agriculture with competent instructors in the theory of the subject, including vegetable physiology and agricultural chemistry and experimental farming and agriculture." Eight branches were established between 1838 and 1849 but for lack of funds were short lived. "None of these attempted to teach agriculture." (271)

The university was opened in 1841 with two teachers and six students. The number of students speedily increased and the first class at graduation in 1845 contained eleven members. But it was only after considerable agitation that the teaching of agriculture was attempted in the University.

The State Agricultural Society and Agricultural Education.

"As early as 1844 Jonathan Shearer ably advocated the more thorough education of farmers in the Michigan Farmer." In 1849 the State Agricultural Society (277) was organized and that year state and county agricultural societies listened with interest to addresses on the need of provision for education directly relating to the theory and practice of agriculture and began to appeal to the legislature for funds for this purpose. For example, Bela Hubbard secured the passage by the executive committee of the State Society of the following resolution:

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"Resolved: That our Legislature be requested to take such legislation as shall appear necessary or expedient for the establishment of a State central agricultural office, with which shall be connected a museum of agricultural products and implements, and an agricultural library, and as soon as practicable an agricultural college and a model farm." (277)

explains

The memorial to the legislature[^] that "a labor school" was contemplated, which "should be attached to, or form a branch of, the State University." The studies should include agriculture, mathematics, accounts, mechanics, natural philosophy, natural sciences (with applications to agriculture), anatomy and diseases of animals, entomology, and to some extent engineering, architecture, landscape gardening, literature and fine arts. As a result of this memorial the legislature passed a resolution April 2, 1850, asking Congress to give Michigan 350,000 acres of land for agricultural schools. The constitutional convention of 1850 put in the revised State constitution a provision (Article 13, Section 11) that "The legislature shall encourage the promotion of intellectual, scientific and agricultural improvement, and shall as soon as practicable, provide for the establishment of an Agricultural School."

"The legislature may appropriate the twenty-two sections of Salt Spring lands now unappropriated, or the money arising from the sale of the same, where such lands have been already sold, and any land which may hereafter be granted or appropriated for such purpose for the support and maintenance of such school, and may make the same a branch of the University, for instruction in agriculture and the natural sciences connected therewith, and place the same under the supervision of the regents of the University."

In 1852 the State Agricultural Society again appealed to the legislature to establish "A State Agricultural College". At the same time Francis W. Shearman, as State Superintendent of Public Instruction, declared in favor of an agricultural college which should be "a labor school" and connected with the State University, for the sake of economical management.[^] (271) It should have a botanic garden and "the studies taught at this college should be of an eminently practical kind." When it seemed that something definite would be done to satisfy the demand for an agricultural college by the State Agricultural Society and other friends of agricultural education, "three different views immediately appeared; one group wished to have agricul-

tural instruction connected solely with the University, another sought to bring it under the control of the State Normal School at Ypsilanti, while a third group wished to have a separate agricultural college." (271)

In the act of March 25, 1850, relative to the normal school at Ypsilanti it was provided that this institution should "give instruction in the mechanic arts and in the arts of husbandry and agricultural chemistry." When this school was established in 1852 it made an effort to give instruction in agriculture.

The question as to how higher education in agriculture should be organized was actively discussed from various angles by the State Agricultural Society and particularly by its executive committee. John Clough Holmes was secretary of the society and a very influential member. He was a native of Salem, Mass. For many years he was active in the agricultural affairs of the State, giving special attention to horticulture. In 1852 he established the Horticultural Gazette, afterwards united with the Michigan Farmer. Ira H. Butterfield, grand-father of President Kenyon L. Butterfield of the Michigan State College, ⁽¹⁹²⁵⁻¹⁹²⁸⁾ was a member of the Executive Committee.

The State Superintendent of Public Instruction urged the society to approve the teaching of agriculture at the Normal School on the ground that "a concentration of the means afforded by the State for the advancement of agriculture must be considered an object of importance at all events, for years to come." (271)

"In December, 1852, Henry P. Tappan, Chancellor of the University, also wrote to the Society, outlining the attitude of the University. [See Transactions 1853.] Dr. Tappan called attention to the provision in the constitution looking toward the appropriation of twenty-two sections of the Salt Spring Lands for the maintenance of the agricultural school, and to the contemplated connection of this work with the University, and proceeds:-

'In anticipation of this legislative grant, we have accordingly organized an Agricultural School, as a part of the scientific course recently adopted by the Faculty and Regents.

The following subjects are embraced in the agricultural course:

- (1) Daily Lectures on Chemistry (elementary and experimental), Chemistry applied to the arts, meteorology and climate.
- (2) Geology and Mineralogy, and the application of the same to mining, drainage, construction of public works, etc., illustrated by specimens from Michigan, the neighboring states and foreign lands; also models and drawings.
- (3) Animal and Vegetable Anatomy and Physiology in general, the physiology and diseases of domestic animals in particular, and the structure and habits of insects in reference to grain, trees and horticultural plants.
- (4) Organic Chemistry and the theory and practice of agriculture, the origin and nature of soils, the different varieties of manure, tillage, tools, etc.

Lectures on these subjects will be given during the next Spring and Summer term, commencing May 1st and ending June 30th.'

Dr. Tappan was requested by the Executive Committee of the Society to deliver the address before the Society at its Fair in September, 1853. In this address, Dr. Tappan made the following statements in regard to the province of the university: "I say, Farmers of Michigan, that our great desire is to make the University useful to you, and we are determined to do it. We will educate all your sons who wish to be educated for the different professions. We will educate those who wish to take a particular course to fit them for a particular business. We will educate those who wish to become strictly literary and scientific men. And beyond all this, we have established and will carry on an Agricultural Department for those who intend to devote themselves particularly to Agriculture. Whatever be the determination of the people of this State in respect to an Agricultural School, we know not how to teach Chemistry, Botany, Mineralogy and Zoology, without giving a course of agricultural science. The scientific perfection of our scheme of studies demands it. We shall do this independently of any consideration as to the disposition of the lands appropriated by the State for agricultural education. Our aim is to make the University one of the first in our country, and, if we can, second to none in the world; and therefore, there is no branch of knowledge that we can lawfully omit.

On March 14, 1853, a circular was issued by the regents of the University of Michigan, announcing that a free course of lectures on agricultural science would be given at the University from April 27 to June 28 of that year. The Rev. Charles Fox was announced as the lecturer on "Theoretical and Practical Agriculture." Mr. Fox was an Englishman, educated at Rugby, and rector of the Episcopal church at Grosse Isle, near Detroit. Other lectures were given by Professor Douglass, of the geological department, and by Professor Sager. Mr. Fox published his lectures in 1854 in the form of a text-book. Fox soon thereafter removed to Ann Arbor; he lectured during the winter, and was soon thereafter appointed "Professor of Theoretical and Practical Agriculture." He died after filling the university position less than two years. He worked in harmony with the State Agricultural Society, and was its delegate to a meeting in Washington of the United States Agricultural Society." (271)

In December 1852 a resolution was adopted by the State Agricultural Society favoring an agricultural school as a branch of the University, with a model and experimental farm of not less than 640 acres but the school and farm "should not be established in immediate proximity to any existing educational institution." (277) This, however, was not wholly satisfactory to Mr. Holmes and other members of the Society and the debate went on. On January 25, 1854 the executive committee of the Society visited the university and called on President Tappan. (277) He informed them that a course of lectures by Professor Fox (See p. 238) was then in progress "embracing all subjects connected with practical and scientific agriculture" and also that Dr. Douglass in chemistry "dwelt fully upon the application of this science to the mechanic arts and to practical and scientific agriculture." In company with Professor Fox and others the committee visited the museum and listened to a lecture by Professor Douglass on "burning gasses". Then they attended a lecture by Professor Fox on rotation of crops, drainage, etc. "He also gave a synopsis of his preceding lectures, with all of which we were highly pleased!" The committee reported in favor of continuation of these lectures "until our legislature shall provide more liberal and extended facilities for agricultural education." The next day the committee was at the Ypsilanti Normal School, where they listened to a lecture by Professor Fiske on the "organic and inorganic nature of soils and the production of vegetable matter by the mechanical operations of agriculture, including manuring, draining, plowing and the proper pulverization of the soil." "The lecture was delivered in a happy style and comprehensive manner."

On the work at this school the committee reported that "the teaching of agricultural science at this institution will be felt to a greater or less degree in almost every school district throughout our State but we do not think the information to be derived from these sources is sufficient to constitute the education of a professional and practical farmer." At a meeting of the committee

December 12, 1854, the matter of an agricultural school was brought up by Mr. Holmes, as secretary. After full discussion on motion of S. M. Bartlett of Monroe it was resolved "that an agricultural college should be separate from any other institution."

This was followed by a memorial to the legislature "praying for an appropriation sufficient to purchase a body of land suitable for an experimental farm and for the erection of suitable buildings for an agricultural school, placing it upon a basis of its own, separate from any other institution of learning, and for the endowment of the same in such manner as shall place it upon an equality with the best colleges of the State." (271)

A petition to the legislature to take action without delay was widely circulated.

Michigan Agricultural College

Mr. Bartlett was appointed to draft a bill establishing the college and he secured the assistance of Isaac P. Christiancy, of Monroe, afterwards chief justice of the State supreme court and United States Senator. The message of Governor Bingham to the legislature, January 4, 1855, recommended the establishment of an agricultural school. The bill was passed substantially as drawn (271) by Mr. Christiancy and was approved by the governor February 12, 1855. This act established the Agricultural College of the State of Michigan as a separate institution under the supervision of the State Board of Education, on a large farm near Lansing, and directed that "the chief purpose and design" of the college "shall be to improve and teach the science and practice of agriculture."

The text of the law, recorded in Transactions of the State Agricultural Society 1856, reads as follows:
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"An act for the establishment of a State Agricultural School.
See Session Laws of 1855, Act No. 130, approved February 12th, 1855.

"Section 1. The People of the State of Michigan enact, that the president and executive committee of the Michigan State Agricultural Society, be and are hereby authorized to select, subject to the State Board of Education, a location and site for a State Agricultural School, within ten miles of Lansing; and subject to such approval, contract for and purchase for the State of Michigan, such lands, not less than five hundred acres, nor more than one thousand acres, in one body for the purpose of an experimental farm and site for such Agricultural School; Provided, That the amount to be paid for such farm and site shall not exceed fifteen dollars per acre, and that the conveyance or conveyances be made to the State of Michigan.

Section 2. There is hereby appropriated twenty-two sections of salt spring lands, or the money arising from the sale thereof, referred to in article 13, section 11, of the constitution of the State of Michigan, for the purchase of land for such site and location, and the preparation thereof, the erection of buildings, the purchase of furniture, apparatus, library and implements, payment of professors and teachers, and such other necessary expenses to be incurred in the establishment and successful operation of said school.

Section 3. Upon the execution and delivery to the secretary of state of the proper conveyance or conveyances of the land, the purchase of which is provided for in the first section of this act, and the certificate of the attorney general that he has examined the title to the same, and finds it unencumbered, and that the conveyance or conveyances are executed in due form, and a certificate from the president and secretary of the Board of Education, that the same is in accordance with the contract or contracts for the purchase of the same, and that the location has been approved by them, the auditor general shall draw his warrant or warrants on the state treasurer for the amount of such purchase, in favor of the party or parties to whom such sum or sums shall be due, payable out of said salt spring lands, or money accruing from the sale of the same; and the said certificates in this section mentioned, shall be filed and preserved in the office of the secretary of state.

Section 4. Upon the purchase of such location and site, there shall be established on such site, under the direction and supervision of the State Board of Education, an Agricultural School, by the name and style of the Agricultural College of the State of Michigan, and the chief purpose and design of which shall be to improve and teach the science and practice of agriculture.

Section 5. The course of instruction in said college shall include the following branches of education, viz: an English and scientific course, natural philosophy, chemistry, botany, animal and vegetable anatomy and physiology, geology, mineralogy, meteorology, entomology, veterinary art, mensuration, leveling and political economy, with bookkeeping and the mechanic arts which are directly connected with agriculture, and such others as the Board of Education may from time to time see fit to prescribe, having reference to the objects specified in the previous section; and the said board may establish such professorships, and employ such professors and teachers, to be called the Board of Instruction of said college, for the instruction aforesaid, as they may judge best for such object; Provided, The sum paid such professors and teachers for the first year after said college shall go into operation, shall not exceed the sum of five thousand dollars, and for the next year, not exceeding the sum of six thousand dollars, and for any years thereafter, such a sum as the State Board of Education may deem necessary, for the successful operation of the institution. Tuition in said institution shall be forever free to pupils from this state, and any number of pupils may be admitted who shall apply from any part of this state: Provided, That in case more

pupils apply than can be accommodated or taught, then said board shall adopt some equitable plan giving to each county a number according to the ratio of population, as it shall appear from the census last taken; and in that case, those from each county shall be admitted in the order in which they shall apply, until the quota of such county be full.

Section 6. There shall be two scholastic terms in each year, the first term commencing on the first Wednesday in April, and ending on the last Wednesday in October, the second term commencing the first Wednesday in December, and ending on the last Wednesday in February; and no pupil shall be received for less than one term, unless by special permission from the Board of Instruction.

Section 7. The Board of Education, upon consultation with the Board of Instruction, shall, from time to time, fix and establish rules as to the number of hours which shall be devoted to manual labor and to study, which may be different in different terms or seasons; but during the first term in such year, the time devoted to labor shall not be less than three, nor more than four hours each day; and no student or pupil of said college shall be exempt from such labor, except in case of sickness or other infirmity.

Section 8. The Board of Education shall appoint one of the professors in said college to be the president thereof, and one to be its secretary, and one to be its treasurer; and the Board of Instruction may establish such rules and regulations from time to time, for the government of said college and instruction therein, as they may deem proper in any matter not regulated by the Board of Education; and the rules and regulations adopted by such Board of Instruction, shall remain in full force until altered by said Board of Education. And said Board of Instruction shall have power, subject to the approval of the Board of Education, to establish by-laws for the government and discipline of the pupils of said college, in regard to conduct and behavior, and to affix such pecuniary penalties as they may deem proper, and to prescribe the causes for expulsion or dismissal of any such pupil, which by-laws shall have the force of law, unless altered, modified or repealed by the Board of Education or the legislature; and the Board of Education shall fix the compensation to be credited or paid for the labor performed by pupils, under the provisions of section 7 of this act.

Section 9. The president of said Board of Instruction shall preside at all meetings of said board, except in cases of sickness or absence; in which case the board may elect one of their number president pro-tempore; and it shall be the duty of the president to see that all the regulations established by this act by the Board of Education and by the Board of Instruction, in regard to the government and instruction in said college, be enforced.

Section 10. The secretary of said Board of Instruction shall record all the proceedings of said Board, and all the regulations and by-laws for the government of said college, and shall publish the same, and furnish a copy thereof to the governor of this state, to each member of the Board of Education, to the county clerk of each county, and to the clerk of each organized township in this state. He shall also keep a full record of all improvements and experiments made on said lands, their cost and results. He shall also keep a careful account with each field, in connection with a plan of the farming lands or farm, exhibiting the position of each, in which shall be shown the manner and cost of preparing the ground, the kind of crop, time of planting or sowing, the after condition, the time and manner of harvesting, the labor devoted to each process, and its cost price, with the cost of preparing the matured crop, for market, and the price for which it was sold, and of such other matters as

the Boards of Education and Instruction, or either of them, may require of him; and he shall furnish a copy thereof at the end of each term to the president of the Boars of Education; and the said record shall, at all reasonable hours, be open to the inspection of any citizen of this state.

Section 11. The treasurer shall receive and keep all moneys arising from the sale of products of the farm, and from fines and penalties that may be imposed; and shall give bonds in such sum as the Board of Education may require. He shall pay over all the moneys upon the warrant of the president, countersigned by the secretary, on account of such contingent expenses of the institution as may arise. He shall render annually, in the month of December, to the Board of Education, and as often as required by said board, a full and true account of all moneys received and disbursed by him; stating for what received and paid, and shall produce vouchers for such payments. The surplus money, if any remain in his hands at the time of rendering such account, shall, if required by said board, be paid over to the state treasurer, to be placed to the credit of said institution.

Section 12. After said college shall have commenced its first term, the superintendent of public instruction shall appoint visitors for the same, who shall perform the like duties required of such visitors by law, in reference to the State Normal School.

Section 13. This act shall take effect immediately.

Even after the passage of the law establishing and locating the agricultural college the opponents of a separate institution and particularly the friends and authorities of the State University did not cease their efforts to prevent the carrying out of this plan. The most comprehensive and ablest statement of the case for the University was made in a paper presented to the executive committee of the State Agricultural Society, March 10, 1855, by Alexander Winchell (1824-1891), professor of Geology, Zoology, and Botany in the University, and later author of important works on geology. (271) He stated first his understanding of the reasons for establishing a separate agricultural college, including (1) jealousy of centralization - a bugbear and unwise desire to distribute public institutions to different towns - "Scientific agriculture is as pertinent to the University as medicine or civil engineering"; (2) "fear that a sufficiently technical education would not be furnished by the university," but after two professorships devoted to agriculture are filled, the student of agriculture will get more in the University than in the agricultural college because of the large number of sciences taught there; (3) fear that the State Agricultural Society would not sufficiently control an agricultural college in

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the University. His reasons for advocating the connection of the agricultural college with the University may be briefly summarized as follows: (1 & 2) a great saving in the first outlay and subsequent support for site, buildings, library, museums and apparatus; (3) a separate college will "necessarily afford instruction somewhat inferior to that offered by the university", because of difficulty in getting equally good professors and equipment; (4) "the particular principles of scientific agriculture constitute properly an inseparable part of university instruction", as is illustrated in the case of medicine and civil engineering; (5) Union "would tend to centralization and reproduction, instead of the dispersion and dissipation, of our educational resources"; (6) time may be saved by attaching the college to the University and (7) this union "is even now a feasible project."

Mr. Holmes was the leader in presenting the argument in favor of a separate agricultural college. He called attention to what was being done in other States, particularly New York, Massachusetts, Pennsylvania and Ohio and laid great stress on the experience of European schools giving instruction in agriculture. He quoted largely from the report of the Massachusetts Commission appointed in 1850 to consider what was best to do regarding the establishment of agencies for agricultural education in that State. ⁽²⁴⁶⁾ (See p. 280) This commission sent President Edward Hitchcock to visit European institutions where agriculture was being taught and he made an elaborate report, which was included in the report of the commission in 1851. Their conclusion on the basis of European experience was "that agricultural professorships in colleges and universities are not sufficient." 1. Because lectures of this sort attract but few of the students of the colleges, who are looking forward to professional life. Such is certainly the case everywhere in Europe. 2. Because the two classes of students, who would thus be brought together, would have too little sympathy to act in concert, and as equals, in the same institution. 3. Because, without such concert and sympathy, one or the other of the classes of students would

feel no pride in the institution; and without such an esprit de corps it could not prosper. 4. Because such professorships, unless numerous, would be entirely insufficient to accomplish the objects desired."

"Even if agriculture is taught in our colleges, academies and primary schools, it needs some one institution devoted entirely to the subject, to give effect and completeness to the subordinate teaching, and to carry it still farther; otherwise the agricultural knowledge will be as the literary would be, if the universities and colleges of the land were taken out of the way, and only the primary schools and academies remained."

"It is necessary that such a school should be in charge of men who understand agriculture, and the wants and wishes of agriculturists, and who know what should be done to improve both." (For further account of this commission's report see p. 281)

Summing up his argument Mr. Holmes said:

"So far then, as we are able to judge from the past experience of others, I think we may safely say that if we expect to meet with success in establishment, continuance, and practical utility of an agricultural school, it must stand separate and apart from all other institutions of learning, and upon a basis of its own. To teach thoroughly the science and practice of agriculture must be the main object of the institution, for our agricultural interest is paramount to all other interests in this state; therefore these teachings must not be made secondary or subservient to any other object." (271)

The president and executive committee of the State Agricultural Society, who under the Act establishing the college, constituted a committee to select and purchase a farm for the college, went ahead and secured the farm on which the college is now located. The Board of Education then undertook the construction of a college hall, boarding hall and small brick stable and with the exception of the barn these buildings were completed by May, 1857. Joseph R. Williams, A.M., was appointed president and director of the farm, together with professors of mathematics, chemistry, English literature and farm economy, and horticulture (J. C. Holmes) and an assistant in chemistry. In an announcement of the college issued December 10, 1856, it was stated that "the course of study has been arranged with direct reference to the wants and interests of the agricultural class in our State. * * * Special attention will be given to the theory and practice of agriculture in all its departments and minutiae." (271)

May 11-13, 1857 entrance examinations were held and 73 students were admitted.

The exercises of dedication took place May 13, 1857 and were recorded in a pamphlet entitled "The Agricultural College of the State of Michigan, Lansing, 1857." They took place "in the presence of the Governor, several officers of the State Government and a large concourse of citizens from various parts of the State." (271) Addresses were delivered by H. L. Miller, president of the Board of Education, Governor K. S. Bingham and President Williams. In discussing the course of instruction proposed for this college President Williams said that

"The farmer ought first to be a sound man physically. He should be taught the laws on which his own life and health depend. He should have capacity for thought and action. Morally, physically, intellectually, he must be a man, before he can be a farmer.

A farmer is a citizen, obliged to bear his portion of public burdens, amenable to the laws, and in a humbler or a wider range, may become an exponent of society. He should be able to execute, therefore, the duties of even highly responsible stations, with self-reliance and intelligence. The constitutions of the Union and of his State, he should comprehend, and the laws and forms relative to township and county officers and their duties. He should be qualified to keep farm accounts, draught ordinary instruments, survey his farm, and level for drains or highways. His native language should be a flexible instrument at his command, which he should speak and write with ease and vigor, that he may impress and instruct others, avert mischief or inculcate truth."

The farmer should be taught the sciences and their applications to agriculture, including chemistry, veterinary art, entomology, and natural philosophy. On the college farm the student should "test various modes of cultivation, the effect of rotation of crops, the economy of labor-saving implements, the relative qualities of manures, the results of judicious draining, the relative productiveness of seeds, vegetables and fruits, and the characteristics, uses and value of various breeds of livestock." The Governor stated that

"One of the highest objects to be attained by the establishment of an Agricultural College, is to elevate and dignify the character of labor. This can only be attained by an increased amount of knowledge, by making the laborer intelligent, by diffusing the light of science all around the pathway of the husbandman, so that an active, enlightened thought shall accompany the hand in guiding the plow, and in all the various operations of the field."

An ode composed for this occasion by I. M. Cravath contains these lines -

"Tiller of the earth!
Thy day of triumph's come!
Science now owns thy worth,
And builds with thee her home."

Progress up to this point had been made amid much opposition. "The Hon. Reuben Goodrich thus recalls an incident in the early history:

'In 1855-57 I represented Genesee County in the State Senate, at which time there was a strong effort made to abandon the College scheme and sell the farm.

The land for the farm had previously been purchased and one wing of the College built between 1855 and 1857.

Upon that proposition the Legislature was very evenly divided. It looked like the scales were so evenly balanced that one vote either way would kick the beam. The friends of the measure asked for an appropriation - I think of \$40,000 - to proceed with the work, and the battle was over that or the sale of the farm. The College was saved by a mere scratch, and we secured the appropriation asked for." (271) (p. 17)

And even after the college was opened efforts were made from time to time to change its status. In 1859 and finally in 1869 bills were introduced in the legislature to connect this college with the University, and transfer it to Ann Arbor. In 1859 the Board of Education recommended the creation of a State Board of Agriculture, among whose duties would be the general control of the agricultural college. Under the Act of 1861 establishing this board it was given power "to confer, for similar or equal attainments, similar degrees or testimonials to those conferred by the University of Michigan."

(For additional statement regarding Michigan Agricultural College, see p. 403)

Connecticut

Yale Scientific School.

In Connecticut the movement for college education relating to agriculture came from the interest of certain scientists at Yale College in the applications of the sciences, particularly chemistry, to the useful arts. Yale College under the leadership of Timothy Dwight (1752-1817), a graduate of Yale in 1769 and president from 1795-1817, became active in the teaching of the natural sciences. Dwight, as we

have seen, was a member and for some time president of the New Haven County Agricultural Society and doubtless was interested in the application of the sciences to agriculture. It was under his influence that Benjamin Silliman (1779-1864), a native of Connecticut and a graduate of Yale in 1796, gave up the profession of law and was made professor of chemistry and natural history in 1802 with the understanding that he would be given an opportunity to make special studies in preparation for this work. He studied chemistry at the University of Pennsylvania and in 1805 went to Europe, studied at London and Edinburgh and visited several countries. Returning to America in 1808 he became professor of chemistry, geology and mineralogy at Yale, where he taught until 1853 when he was made professor emeritus.

In his "Journals of Travels" published in 1810 Silliman gives an account of scientific institutions in Europe. In 1818 he founded the American Journal of Science and Arts, of which he was editor for 28 years. He was active in the Lyceum movement and delivered many popular lectures on scientific subjects in different parts of the country.

His son, Benjamin Silliman Jr. (1816-1885), graduated at Yale in 1837 and took much interest in the applications of science to the arts. As early as 1842 he had private pupils in the sciences, including John P. Norton. In 1845 when the Philosophical Department of Yale College was established he was made professor of chemistry and kindred sciences as applied to the arts. "A benefactor proposed to give \$5,000 for the endowment of a Professorship of Agricultural Chemistry and of Vegetable and Animal Physiology, provided that \$20,000 be raised for that purpose. Three professorships were at once established and in 1847, the name of the new Department was changed to the Department of Philosophy and the Arts." (1st An. Rpt. Sheffield Sci. School 1866)

That year sufficient interest in agricultural education was aroused in the Connecticut legislature to induce the joint standing committee on education to urge "the importance of scientific instruction in its relation to agriculture and the useful arts" and to recommend the establishment of a professorship of agriculture and the arts at Yale College.

Before this, according to Professor Brewer, "almost as soon as chemistry was taught in the college, its applications to agriculture formed a part of the general course of lectures upon chemistry, and after a time specific lectures on agricultural chemistry are said to have been delivered. They certainly were delivered by professors outside of the college course. Professor B. Silliman Jr. delivered, by invitation, a course of lectures on agricultural chemistry in the winter of 1845-46, in the city of New Orleans. Students came for private instruction in chemistry, for its agricultural applications, before the Scientific School was founded, even in its rudimentary form." (Ms. notes by Brewer)

In 1846 John Pitkin Norton (1822-1852) was appointed professor of agricultural chemistry and vegetable and animal physiology. He was born at Albany, New York, but moved to Farmington, Conn., in 1835. As a boy he was not interested in the studies usually taught in schools but fortunately one of his teachers took advantage of his interest in making a collection of minerals to direct his studies to mineralogy and chemistry. He determined to become a farmer and his father assented to this on condition that he would be educated for that business.

From 1838 to 1843 he worked at farming, principally on his father's farm, finally taking entire charge of a part of this farm. His winters were spent in studying the sciences and other subjects at Albany, New York City, Boston and Yale College. Then he went abroad to fit himself to give instruction in agricultural chemistry and studied at Edinburgh in the laboratory of the Agricultural Chemical Association under Prof. James F. W. Johnston and again in 1846 at Utrecht, Holland, under Mulder. Meanwhile he was a contributor to agricultural journals in this country, prepared two papers for the British Association for the Advancement of Science, and won a prize offered by The Highland and Agricultural Society of Scotland for the best analysis of the oat plant. With Dr. Johnston he made many excursions to the best farming districts of England and Scotland.

Norton preferred to confine his professional work to agricultural chemistry and took up his duties under that title in the fall of 1847. At that time the catalogue of Yale College announced that "Professor Norton will instruct in the applications of science to Agriculture and in Analytical Chemistry". Under the subheading "School of Applied Chemistry" it continued: "Professors Silliman and Norton have opened a Laboratory on the College grounds, in connection with their departments, for the purpose of practical instruction in the application of science to the arts and agriculture. Every facility will be afforded to those who desire to obtain special instruction in general and analytical Chemistry and in Mineralogy. A course of lectures on the connections of science with agriculture, by Professor Norton, will commence in January and continue about two months, at the rate of about four lectures in each week. Professor Silliman, Jr., will deliver during the summer a course of lectures upon some other department of applied Chemistry." (150)

Regarding Norton's lectures the memorial to him published in 1853 states:

"The deep interest he felt in his subject led him to communicate all the knowledge possible in the lecture hour and by perspicuity of style and skill of arrangement to make it most available to the student. We have the testimony of the best scholars that they attended no lectures where they got more information. The number of scholars the first year was small but it each year increased, till at last the experiment of the school was decided, a new department of professional study in the university was created and a liberal and scientific pursuit opened to the young men of our country."

"During 5 years of incessant toil he received no salary whatever and the tuition money which he received after deducting expenses would not amount to the pay of a day laborer. He declined an offer with a salary of \$3,000 by one of the large colleges of the country if he would devote himself to chemistry in its application to the arts and had other lucrative offers, but he regarded the interests of agriculture as paramount to all others and could not be diverted from them and was loyal to Yale where he had received much of his education. Within a few hours of his death he bequeathed all his apparatus with his books and other articles to the institution." (148)

The school here referred to was the Yale Scientific School established in 1852, which in 1860 became the Sheffield Scientific School.

Norton delivered many addresses before agricultural societies and elsewhere and contributed to scientific and agricultural journals. In 1850 he published the Elements of Scientific Agriculture, originally written as an essay for a prize offered by the New York State Agricultural Society. He also edited Stephen's Farmers' Guide, to which he added notes and an appendix.

His friends at Albany, New York, secured his interest in the movement to establish a University there, which it was hoped the State would patronize, especially as an agency for the promotion of agriculture and the sciences related therewith. In the winter of 1851-52 he repeated there the course of lectures given that year at Yale and this additional work is thought to have contributed to his early death which occurred the following October.

Norton was succeeded by John Addison Porter who came from Brown University. In 1856 Professor Porter was transferred to the professorship of organic chemistry in Yale College and his place in the Scientific School was taken by Samuel William Johnson, who had studied under Norton and had been assistant in the Analytical Laboratory, giving special attention to analyses of fertilizers. He was teacher of agricultural chemistry from 1856 to 1896. (150)

Johnson's primary interest was in agricultural research but through his dealings with his students and through his outside lectures and writings he exerted a broad influence on the movement for agricultural education in this country. His textbooks entitled "How Crops Grow" (1868) and "How Crops Feed" (1870) were very important in the early days of the land-grant colleges and have a considerable permanent value.

The Yale Scientific School was in a difficult financial condition until 1860 when Mr. Joseph E. Sheffield, one of whose daughters was the wife of Professor Porter, bought the old Medical School building, remodeled and enlarged it for the

use of the Scientific School and gave funds which put the School on a permanent foundation. About this time Professor Porter conceived a plan to increase public interest in the agricultural work of the School. This was set forth in general terms in an article in the New Englander in November, 1859. Attention was called "to the importance of new agencies for the diffusion of agricultural knowledge." The press is doing much but lacks the ability to arouse the enthusiasm which comes from the contact of man with man. The introduction of books on elementary science would be a good thing but is difficult of accomplishment. Agricultural institutions under public or private auspices are essential but are not likely to come until there is a wider appreciation of their need. There is much undiffused knowledge of agriculture and horticulture and of the sciences relating thereto. The solution proposed was "the enlistment of practical men who are not professional teachers, in the work of instruction, and their combination in such numbers that a small contribution of time and labor from each shall make a sufficient aggregate to meet the object in view." "To realize such association of knowledge we would then assemble from the farm, the garden, the nursery, the vineyard, and from the ranks of science, gentlemen distinguished for their skill in the various specialties of agriculture - practical and theoretic - and call on them to make each his contribution to the work of instruction. And then we would summon the intelligent and enterprising farmers of the country, young and old, to gather and learn from the most highly qualified of their own number, the secrets of their success."

Under Professor Porter's leadership, with the assistance of Johnson and other members of the Yale Scientific School, and a number of lecturers from outside, a four weeks' course on this plan was carried on at New Haven during February, 1860. (149) Three lectures were given each day. Among the 26 lecturers were S. W. Johnson on the chemistry of the plant and its food; Daniel C. Eaton on vegetable physiology; W. H. Brewer on tobacco and hops; T. S. Gold on root crops and sheep; Marshall P. Wilder on pears; P. Barry on fruit trees; Henry F. French on drainage; Charles L. Flint

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the dairy; Asa Fitch on entomology; and Mason C. Weld on agricultural associations. Demonstrations were also given. An eyewitness at the time said "Mr. Barry whittling at his pear tree before the audience is worth a whole treatise on grafting and pruning. Mr. Gold's discourse on sheep, interspersed with the bleating of his Cotswolds, and punctuated with the black noses of his Southdowns, is worth a volume on mutton and wool."

In concluding his lectures Mr. Weld "advocated strongly the establishment at once of an experimental farm in connection with a thoroughly furnished laboratory, referring to the debt the world owes Lawes and Gilbert for their experiments at Rothamsted and to the weighty results developed by the investigations in France and Germany." About 500 persons attended these lectures, including 172 from Connecticut, 3 from Massachusetts, 35 from New York, and smaller numbers from 13 other States. The lectures were reported in the New York Tribune, referred to in many other papers and finally put into book form. "This Scientific Agricultural Convention not merely gave impetus to the local effort for agricultural education, but aroused throughout the country a wider interest in the subject." Arrangements were begun for a second course the following year but were given up on account of impending war. Instead of this, Johnson's course at the Scientific School, in which he discussed the relations of science to agriculture, was opened to the public. In 1862 the School continued its internal activities in spite of the war and that year Johnson had 19 students in his chemical laboratory.

MARYLAND

First The State Agricultural Chemist.

As early as 1830 a joint resolution was passed by the Maryland legislature, proposing an agricultural school for the State. A State geologist made his first report December 29, 1834 and at the session of the legislature in 1847-48 "An act to provide for the appointment of an Agricultural Chemist for the State" was passed. (214) It was made his duty to examine the soils in each county, as well as marl or other

vegetable or mineral deposits. He was also to deliver one public lecture in each elective district in each county and a course of lectures at each county town and at some central place in Baltimore County and to give a copy of his lectures to the clerk of the levy court or tax commissioners, for publication if they thought this expedient. He was to make an annual report "of his proceedings and such other matters touching the agricultural interests of the State, as may be considered necessary." This act was amended in 1852 to provide for an assistant chemist and to reduce the number of lectures required in each county to three. James Higgins was the first State Agricultural Chemist and made reports for several years which contained considerable information on agricultural subjects. It did not prove practicable to fully carry out the law regarding lectures and there was considerable disappointment because this educational requirement was not adequately fulfilled.

Maryland Agricultural College

In 1848 the organization commonly known as the Maryland State Agricultural Society, which had developed out of "The Maryland Agricultural Society" formed in 1818 "for the Eastern Shore", appointed a committee "to inquire into the propriety of establishing an agricultural school." While this was being considered James T. Earle, a member of the board of trustees of the society, said in a letter dated February 5, 1849, "to aid in raising the means for the establishment of this school, and the endowment of its proper professorships, I would advise a memorial to the Congress of the United States, asking a donation of land to be located in some of the Southwestern States." At the first exhibition of the Society Col. W. M. Cary delivered an address in which he urged the professional education of farmers in schools. In the State Constitution of 1851 Article 41 of the declaration of rights provided "That the legislature ought to encourage the diffusion of knowledge and virtue, the promotion of literature, the arts, sciences, agriculture, commerce and manufactures, and the general melioration of the condition of the people." In 1852 a committee on agricultural education of the State Agricultural Society reported in favor of the establishment

of a professorship of agricultural chemistry at St. John's College at Annapolis. The next year this recommendation was modified to include professorships of natural history and chemistry and a practical farmer at some existing college. The Society needed to own land on which to hold its exhibitions and it was proposed to secure a farm for this purpose and as the site of an agricultural school and model farm and to do this by getting subscriptions of private funds. This led to suggestions that the Society ask the legislature to endow a professorship in the proposed institution and that the capital stock of the Society be increased sufficiently to make it possible to maintain a union with the college.

In October 1854 the Society issued an address relative to the proposed college and farm to the citizens of Maryland and contiguous States, in which it was stated that it was proposed to locate the institution within 10 miles of Baltimore. A year later it was proposed to employ an agent to solicit subscriptions and a committee was appointed to prepare a suitable heading for the subscription list.

In December 1855 Governor Ligon commended the project in his message to the legislature and on January 14, 1856, a committee of the Society conferred with the agricultural committees of both houses and asked for an appropriation of \$6,000 annually on condition that \$50,000 be raised for the college.

March 6, 1856, the legislature passed "An act to establish and endow an Agricultural College in the State of Maryland. The preamble to this act is as follows:

"Whereas, it hath been represented to the Legislature, that certain wise and virtuous citizens, are desirous of instituting and establishing in some convenient locality within this State, an Agricultural College, and Model Farm, in which the youthful student may especially be instructed, in those arts and sciences indispensable, to successful Agricultural pursuits, and whereas,

It doth appear to this Legislature, that while the wise and learned in the present age have cultivated with laudable industry and applied with admirable success the arts and sciences to other pursuits, the most necessary, useful and honorable pursuits of agriculturists have so far been most lamentably neglected; and whereas,

It is the province and duty of the Legislature to encourage and aid the philanthropic and patriotic citizens in their efforts to disseminate

useful knowledge, by establishing an Agricultural College, and Model Farm, which shall, in addition to the usual course of scholastic learning, particularly indoctrinate the youth of Maryland, theoretically and practically, in those arts and sciences, which, with good manners and morals, shall enable them to subdue the earth and elevate the State to the lofty position its advantages in soil, climate, etc., and the moral and mental capacities of its citizens entitle it to attain." (215)

In the act James T. Earle and eight other persons are appointed commissioners to obtain subscriptions to the stock of the college to an amount not exceeding \$500,000, in shares of \$25 each. As soon as at least 2,000 shares have been subscribed for, the subscribers are made a corporation with authority to establish and operate the Maryland Agricultural College and Model Farm. When ^{one} half of the shares have been paid for the stockholders are to meet and elect 22 trustees, one from each county and one from the city of Baltimore, for a term of five years but their successors are to serve for two years. The trustees are to appoint the faculty, determine the course of study and do whatever else is required for the successful operation of the college. It is also their duty to carry on experiments on the farm and to require the instructor in chemistry to analyze the soil samples sent to him by citizens of the State. Annual reports on the condition of the college and the experiments are to be made to the legislature. If within two years 2,000 shares have been subscribed for, trustees elected, a farm of not less than 50 acres purchased and the necessary buildings erected thereon, the State will make an annual grant of \$6,000 to the college, provided that the legislature may at any future time withdraw this.

This act was amended in 1858 by reducing the par value of shares of stock to \$5 and providing for the election of a trustee from the District of Columbia, and the Eastern and Western Shores of Maryland, and honorary trustees without a vote from other States. Nearly 500 persons made subscriptions within a short time and the institution was organized. A farm of 428 acres in Prince George County, within 10 miles of Washington, D. C., the present site of the

University of Maryland, at College Park, was purchased and the corner stone of the main building was laid August 24, 1858. To carry out the provision of the Act of 1856 with reference to the college farm, experiments were begun in 1858 to test the relative value of the different manures offered for sale in Baltimore and Washington as applied to corn, oats and potatoes. The college building was 120 feet long, 55 feet wide and 5 stories high, with accommodations for 200 students.

The first circular, issued in July 1859, stated that the college was to be -

"An Educational Institution in its most comprehensive sense. Its definition of education is that it is the united symmetrical development and instruction of the religious, the intellectual and the physical qualities of the man. * * * It is not to be supposed then, that what we designate an Agricultural College aims merely at professional instruction in agriculture. * * * It offers him the advantage of the most approved systems of moral and intellectual culture; and super-adds to these for his physical training, moderate and systematic exercises in the field and in the workshop, as the best means of laying the foundation of future health and energy, in a well developed, robust, physical constitution. * * * The institution will have an experimental and model farm, with a plan for the advancement of Agricultural Science, based upon practice."

The college was opened for students in September, 1859 and within a year 105 students matriculated. Boys were admitted to a preparatory course from 12 years of age and the regular college course occupied four years. The subjects in this course in 1861 were Latin, Greek, French, German, English, history, geography, mental and moral philosophy, political economy, mathematics, botany, entomology, and pomology, with daily work in the farm and garden. The first professor of the science of agriculture, including chemistry and its applications to the arts, geology and mineralogy, was George C. Schaffer, A.M., M.D., but he was soon succeeded by Montgomery Johns, A.M., M.D. In 1861 Townsend Glover was professor of natural history, botany and pomology, who used his models of fruits and his insect collection in connection with his instruction.

The Civil War prevented the development of the college as had been expected but it continued its operation. The first class of two students, receiving the degree of

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B. S. and A. B., respectively, was graduated in 1862. In 1865 there were 75 students. The regular course continued to be chiefly classical but there was a partial or agricultural course, which included English, Mathematics, and Agricultural Science, with modern languages optional. Agricultural subjects included in the course were: For Freshmen, farm memoranda; Sophomores, farm memoranda and Campbell's Agriculture; Juniors, agriculture and entomology; Seniors, agricultural chemistry and entomology. An agricultural society was organized within the college, which held some public meetings to which farmers were invited.

In 1865 the college was given the income from the Federal land-grant and in 1866 the legislature granted it \$45,000 in three annual installments, for the payment of its debts and the purchase of furniture and apparatus but on condition that the State of Maryland be made equal joint owner of all the property of the college. The Board of Trustees was reduced to eleven members of whom 4 must be members of the State Board of Education, six residents of Maryland and one of the District of Columbia. The annual state appropriation from 1859 to 1881 was usually \$6,000, but it was then withdrawn and that year the college had only 36 students.

Thereafter the institution had a slow growth and it was difficult to get the State to take any large interest in it as long as it remained partly on a private foundation. The annual appropriation of \$6,000 was resumed in 1891 and increased to \$9,000 in 1895. Moderate appropriations for buildings were occasionally made. In 1914 the legislature passed an act to foreclose the mortgage on the college property held by the State. By this action the State, which already owned a half interest, took over the balance, with the consent of the private stockholders and thus the college became wholly a public institution. In 1916 its title was changed to Maryland State College of Agriculture and in 1920 it was combined with other schools in the University of Maryland. Since then it has had a large development and its agricultural work has been greatly strengthened.

PENNSYLVANIA

Farmers' High School (now State College)

Members of the Philadelphia Society for Promoting Agriculture and others in Pennsylvania from time to time sought to have the State legislature do something definite for the promotion of agricultural education.

On March 25, 1837, the committee on agriculture in the Senate, to whom was referred the petition of citizens of Union County for legislative aid to agriculture made the following statement in their report:

"It is evident that means must be used to have our farming conducted on scientific principles. It must in some way be interwoven with our system of education. * * * An agricultural school and a pattern farm under proper regulation would imbue the minds of its pupils with valuable principles and would exemplify and illustrate those principles with a corresponding and successful practice. This would be expensive but a very small ratio of increase in the annual production of our farms would repay it with enormous interest." One successful school would lead to others. The committee, however, thought it was too late to form a bill at that session. (472)

On May 15, 1850 the Philadelphia Society issued an address to the farmers of Pennsylvania in which it proposed a convention at Harrisburg to form a State Agricultural Society. This meeting was held January 21, 1851 and the society was organized. The legislature gave it a charter March 29, 1851 and an appropriation of \$2,000. One of the first acts of the society was to hold an exhibition near Harrisburg. At the first meeting of the society in 1851 the establishment of an agricultural school was suggested in a letter from W. D. Brinckle. In the message of Governor William Bigler to the legislature in 1853 was a recommendation for the establishment of such an institution. When the State Agricultural Society met January 18, 1853 and elected Frederick Watts president, it passed the following resolutions: 1 - That the Pennsylvania State Agricultural Society highly approves of and concurs in the recommendation of the Governor in his annual

message that an institution to impart instruction in the Science of Agriculture should be established and that legislative provision be made for the appointment of an agricultural chemist; (2) that a committee of five be appointed to report at an adjourned meeting this evening on the expediency of adopting measures for the establishment of a State Agricultural School, to be called (460) "The Farmers' High School of the State of Pennsylvania".[^] The report of the committee favored this project and recommended the calling of a convention of delegates chosen by the agricultural societies "where such are located and in other districts by the friends of agricultural education." This convention met at Harrisburg, March 8, 1853, unanimously favored the establishment of a school for the education of farmers and appointed a committee to appeal to the legislature. A plan for the school was presented to the State society January 20, 1854 by Frederick Watts, and the matter was put before the legislature with the result that an act was passed April 13, 1854 incorporating an institution with that name. This was to be "an institution for the education of youth in various branches of science, learning and practical agriculture as they are connected with each other." "The president and vice-president of the Pennsylvania State Agricultural Society and the presidents of the several county agricultural societies * * * shall be ex-officio members of and constitute the board of trustees." The principal shall be a good practical farmer with whatever scientific attainments the board shall deem necessary. The school must have a farm of at least 200 acres but the income from its property shall not exceed \$25,000. The State Agricultural Society may make an initial appropriation of \$10,000 to the school and other sums annually. This act was found defective in some respects and particularly because the board of trustees was too large and unwieldy to function properly.

A few of the trustees met June 13, 1854, and through a committee decided that the charter should be amended and an appropriation asked for from the legislature.

It was estimated that the farm, buildings and equipment for the school would cost \$40,000, which might be met by a State appropriation of \$20,000 in four annual instalments, a contribution of \$10,000 by the State Agricultural Society and a mortgage of \$10,000. The annual expenses would include the salary of the principal, \$2,500, two professors at \$2,500 and one at \$1,200, and miscellaneous expenses of \$10,000. These would be more than covered by an annual contribution from the State Society of \$5,000, tuition of 200 pupils at \$75, \$15,000, and sale of farm products, \$4,000. An address to the people to support the school and suggest places where it might be located was issued July 21, 1854.

A substitute act of February 22, 1855, was therefore passed, at the request of the State Society, in which the number of trustees was limited to thirteen, including the Governor, Secretary of State, President of the Pennsylvania State Agricultural Society and the Principal of the School, ex-officio, and nine other persons named in the act, among whom was Judge Frederick Watts. He was chosen to be the first president of the board. He was a graduate of Dickinson College, had been the first president of the State Agricultural Society and in later years was United States Commissioner of Agriculture. (See p. 535)

Another incorporator and long-time trustee was Hugh Nelson McAllister, vice-president of the State Agricultural Society, and owner of a farm near Bellefonte, Pa. He supervised the laying out of the school farm and planned experiments on rotation of crops and the application of fertilizers, which were continued for many years.

In a petition signed by James Gowen, as president of the State Society, March 28, 1855, the legislature was asked to appropriate \$20,000 for the school, to which it responded by granting half that amount.

On July 17, 1855 the executive committee of the State Society appropriated \$10,000 to the school and afterwards directed the treasurer to sell bonds to this amount. A circular was also issued asking 1,000 persons to pay \$10 to become life members of the Society in order that money might be provided for the school. The trustees considered various propositions for the location of the school and accepted General Irvin's donation of 200 acres of land in Centre County at the present site of Pennsylvania State College, together with \$10,000 from the people of that county. They also leased an adjoining 200 acres with privilege of purchase at \$60 an acre, which was afterwards done.

William G. Waring was appointed superintendent of the horticultural department and proceeded to lay out the farm and plant orchards, hedges, etc. A considerable number of field experiments were also begun. On December 3, 1856, Judge Watts reported that a barn costing \$3,500 and a farm house had been erected and a school building begun to cost \$55,000. This building was to be 233 feet long and 5 stories high, with wings at either end.

On May 20, 1857, the legislature gave the school \$25,000 to be offset by an equal amount already secured by subscription, and an additional \$25,000 which might be paid in instalments of \$1,000 whenever a like sum had been subscribed.

This act also provided that an office should be established at the school for the analysis of soils and manures sent in by citizens and that reports of experiments with plants, soils and live stock should be sent to at least one paper in each county, monthly or as soon as results were available.

Mr. Waring was appointed general superintendent of the school and professor of horticulture and professors of mathematics, English literature and natural science were selected. On February 16, 1859 the school was opened. Dr. Pugh thus describes that event:

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"Over one hundred pupils had engaged places, and sixty-nine were present on the first day of opening; during the session 119 students were entered, though there were never more than about one hundred at any one time, owing to the dismissal and expulsion of some and the withdrawal of others. The school was opened under innumerable difficulties and disadvantages. The buildings were only partially finished, and in the absence of the intended dining-room and kitchen a board shantee, which could neither be kept warm in cold nor dry in wet and stormy weather, was used to cook and eat in. Proper apartments for museums, laboratories, and recitation rooms were wanting. The farm was yet rough, and the lumber and materials for mason and brick work for the completion of the building, were piled around in shapeless masses on all sides of the latter, rendering it almost impossible to get about it, and presenting a most forlorn aspect to the students, who first entered the college, through the well-tramped mud of the breaking up of the winter frosts." (457)

On December 7, 1859 the trustees formally elected Evan Pugh (1828-1864)
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Ph. D., F.C.S., president of the school. He was born at Jordan Bank, Chester County, Pennsylvania. At the age of nineteen when he was a blacksmith's apprentice, "he bought the residue of his time, supported himself and studied for a year at a manual labor school at Whitestown, [in] which was the village of Whitesboro, See p. 172] N. Y., then having fallen heir to a small estate in Oxford, Pennsylvania, which included the rather unusual adjunct of an academy, he taught this school for two years. In 1853 he sold his school which had prospered under his management and went abroad for study." At Leipsic, Germany, he met ~~prof~~ S. W. Johnson of Connecticut, who became his life-long friend and correspondent. In 1855 they considered returning to America to jointly establish an agricultural school in Pennsylvania and when Johnson returned to this country that year he suggested to the trustees of the Pennsylvania State Agricultural Society that Pugh was the best man to place at the head of the school they were fostering. He studied at the Universities of Leipsic, Göttingen and Heidelberg, and in Paris, and received his doctor's degree at Göttingen in 1856.

In 1857 he proposed to J. B. Lawes that he should make at Rothamsted an investigation on the accumulation of free nitrogen by plants. This proposition was accepted after he had gone to Rothamsted and convinced Lawes of his ability to conduct such an investigation. He worked there for two years and reported his findings which

seemed at that time to settle the question in the negative by confirming the work of Boussingault. Returning home in the autumn of 1859 he assumed the duties of the presidency of the Pennsylvania Farmers' High School and continued to work with great zeal in that office until his untimely death in 1864 in the midst of a struggle with reference to the retention by this institution of the land-grant fund, a share in which was claimed by a number of other colleges in the State.

In the first catalogue, issued in 1859, it is stated that "the object of the Farmers' High School of Pennsylvania is to afford a system of instruction, as extensive and thorough, as that of the usual course in our best colleges, but to differ from the latter, in devoting no time to the study of the ancient languages, and in devoting a correspondingly longer time to scientific instruction; most particularly is it desirable to develop and adopt a system of instruction, which shall embrace, to the fullest extent possible, those departments of all sciences which have a practical or theoretical bearing upon agriculture, and agricultural interests." (454)

Labor to the extent of 3 hours a day was to be combined with study during the college course. The curriculum included in the first year general chemistry, botany, anatomy and physiology, practical agriculture and the details of management of the college farm; in the second year agricultural chemistry, vegetable anatomy and physiology, zoology and veterinary, geology and practical agriculture and horticulture; in the third year surveying, veterinary surgery, entomology, agricultural botany, and practical agriculture and pomology; in the fourth year veterinary pharmacy, gardening, agricultural accounts and farm management. Along with these studies were English language and literature, arithmetic, algebra, geometry, analytical geometry, calculus, and qualitative and quantitative chemical analysis.

In a separate document that year a nursery catalogue was published by the school, containing a list of varieties of orchard and small fruits, decorative plants, shrubs and flowering plants which the school is prepared to sell. "One of the objects of the institution is that of disseminating well-tried and valuable subjects of farm and garden culture." (455)

Financial trouble growing out of the coming on of the Civil War made it very difficult to secure the means necessary to the continuance of the school but on April 18, 1861, an act was passed by the legislature granting \$49,900 to complete the buildings.

This act has a preamble, justifying the appropriation because this school "combining manual labor with the acquisition of scientific knowledge has been in operation over two years with over 100 students, demonstrating by actual results the practicability and expediency of the union."

That year the first class of eleven persons was graduated with the degree of Bachelor of Scientific Agriculture. The terms of the charter of the school made it possible under State law to change its name by court order and on May 1, 1862 it became "The Agricultural College of Pennsylvania." It continued to have this name until January 26, 1874 when by a similar process it became "The Pennsylvania State College." (462)

The changes of the name of this institution represent the growth of the ideas of its managers and the public regarding what its status in the educational system of the State ought to be. In his inaugural address at Commencement in 1860 President Pugh said that in none of the European agricultural schools and colleges had he found "the fundamental idea of thorough study and manual labor" maintained as in the "Agricultural College of Pennsylvania." Undoubtedly this was affected by the agitation for the Morrill land-grant act and after its passage by the struggle this college had to secure and maintain its place as a beneficiary of that act. Even during Dr. Pugh's life the breadth of its opportunities grew in his mind and he came to see

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that it should become much more ~~of~~ an agricultural institution. One step in this development is shown in the pamphlet which he prepared for a committee of the Board of Trustees in 1862 wherein it is set forth that the college should be not only an educational institution in which a wide range of natural sciences and their applications to agriculture, together with agricultural practice, should be taught but also "an experimental institution" in which the principles of agricultural science should be developed, as well, as a "means of protecting the industrial interests of the State, particularly by defending the farmers against frauds in the sale of manures, seeds, plants and implements." (448)

The undergraduate course ~~was~~ made more elaborate, particularly as regards the sciences and mathematics, provision ~~was~~ made for graduate courses, while at the same time a "partial scientific and practical course" ~~was~~ arranged for those students "who are incapable of making progress in mathematical studies" and a short "practical course" for those students of limited education who desired to get some benefit from the study of agriculture at the college. (For further account of this college, see p.478)

GEORGIA

Professorship of Agriculture in University of Georgia

Agricultural instruction at Franklin College of the University of Georgia was provided for in 1854 by the gift of \$20,000 from Dr. William Terrell of Hancock County. In a letter to the Board of Trustees, of July 27, 1854, he praises the form of government of the United States and declares that every patriot should do what he can "to give perpetuity to the compact of these confederated States. Education is doing much for this great object in every department of knowledge except in agriculture", in which "the United States are far behind most of the States of Europe."

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The best form of government for a country where a system of agriculture prevails that is constantly tending to impoverish the soil, cannot long sustain a thrifty population, or be able to defend itself. To avoid such a calamity, which there is reason to fear will be our condition at no very distant day, the people of the Southern States must find the means of preserving their lands from destruction by bad tillage, which is so strikingly observable in every part of the country.

To aid in this great enterprise, if you will allow me to call it such, I propose to your honorable body, to give to Franklin College, Bonds of the State to the amount of twenty thousand dollars, the annual interest of which shall be applied permanently as compensation for a Professor, whose duty it shall be to deliver in the College, a course of Lectures during its term, on 'Agriculture as a Science; the practice and improvement of different people; on Chemistry and Geology; so far as they may be useful in Agriculture; on Manures, Analysis of Soils, and on Domestic Economy, particularly referring to the Southern States'; the Lectures to be free.

If this proposition is acceptable to you, I shall ask the privilege of recommending to your consideration for the appointment of the first Professor, Dr. Daniel Lee, who has spent twenty years of his life in the study and practice of Agriculture, and who will bring to its duties, all his skill and a zeal that ought to ensure success. (169)

The Board gladly accepted Dr. Terrell's gift, established the Terrell Professorship of Agriculture and unanimously appointed Dr. Daniel Lee of the State of New York to fill this professorship, beginning with January 15, 1855. It was made his duty "to deliver every year within the College grounds, to the students of the College and such other persons as may choose to attend a course of lectures upon the subjects enumerated by the donor."

A committee of the trustees issued an address to the people of Georgia setting forth the need and value of education in the sciences related to agriculture and expressing the hope that Dr. Terrell's example would "induce the State to add to the endowment, until on the foundation of the Terrell Professorship, a great school of agriculture shall have been erected in which everything that can conduce to its prosperity or elevation, shall be taught both by principle and practice."

Dr. Lee accepted this appointment and held this professorship for about eight years (1854-1862). He was not unknown to the agricultural people of the State since (167) he had been editor of the Southern Cultivator since August 1847 and continued in that position until April, 1859. His home was in Western New York and he had received a degree of Doctor of Medicine. For a time he was associate editor of the Commercial

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Advertiser at Buffalo and from 1844 was on the staff of the New Genesee Farmer, at Rochester, becoming editor of that journal in February, 1845. He was for many years an active member and for a time corresponding secretary of the New York State Agricultural Society. He was much interested in the sciences related to agriculture, particularly chemistry and geology, and delivered lectures on these subjects in different parts of New York. In 1845 he was a member of the legislature and in 1846 he cooperated with General Harmon in the attempt to establish an agricultural school at Wheatland, Monroe County, New York. (See p. 184) That summer, in company with 12 students he made a geological excursion in Western New York and in October gave at the school lectures on agricultural chemistry and geology to which teachers were especially invited. From 1851 to 1853 he was in Washington as collector of agricultural statistics for the agricultural section of the Patent Office and in 1852 was among the delegates who organized the United States Agricultural Society. He also prepared for publication the first volume of its proceedings.

OHIO

Norton S. Townshend and Ohio Agricultural College

In Ohio the agricultural leader who finally brought about the establishment of a permanent agricultural college was Norton S. Townshend (1815-1895). (439) He was born in England but came with his parents to a farm in Avon, Lorain County, Ohio, in 1830. Seven years later he began the study of medicine with Dr. R. L. Howard at Elyria, Ohio, and in 1839 attended the College of Physicians and Surgeons of the University of New York where he received the degree of Medical Doctor in 1840. For a time he was a voluntary assistant in the chemical laboratory of Professor John Torrey of that institution. He then went to Europe to visit hospitals and returning home in 1841 practiced medicine first at Avon and afterward at Elyria. In 1848 he was a member of the Ohio Legislature and in 1850 of the Ohio Constitutional Convention and then a member of Congress for one term. In 1853 he was a senator in the Ohio legislature where he secured the passage of the act establishing the "Ohio Institution for the Education of Feeble Minded Youth", of which he was a trustee for 21 years.

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He became deeply impressed with the importance of providing scientific training for young farmers and in 1854 united with Professors Fairchild and Dascomb at Oberlin College and Dr. John S. Newberry of Cleveland, Ohio, in attempting to establish courses of lectures on agricultural science. For this purpose the "Ohio Agricultural College" was organized and was in operation one year at Oberlin and two years at Cleveland.

The original announcement of this enterprise set forth its object and plan as follows:

Ohio Agricultural College

Oberlin, Lorain Co., Ohio

The Object

To place within the reach of Farmers, both old and young, the means of acquiring a thorough and practical acquaintance with all those branches of Science which have direct relations to Agriculture.

Plan

It is proposed to give Courses of Lectures during the Winter months, on all the several departments of Agricultural Science, each principal division being assigned to a different Lecturer, and systematically presented in the same manner as Medical Science is taught in Medical Colleges.

Advantages of the plan

It is adapted to meet the wants of the present as well as of the rising generation. It is proposed to occupy only the Winter months, when the farmer himself, or his sons, may best spare the time.

It presents a view of the whole field of the Sciences connected with Agriculture, in the shortest period of time, and therefore makes their acquisition possible to multitudes who could not attend Universities, or even Schools on experimental farms.

Subjects

The branches taught will embrace whatever pertains to Animals, Vegetables, Land or Labor.

Lecturers

James Dascomb, M.D., Chemistry, in all its applications to Soils, Manures, Animal and Vegetable life, and the Domestic Arts, etc.

This department is regarded as especially important, and means have been provided for its thorough illustration.

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Norton S. Townshend, M.D., Comparative Anatomy and Physiology, with special references to the feeding and breeding of Stock; History and Description of Domestic Animals in their several varieties; Veterinary Medicine and Surgery; Entomology.

This department will be illustrated by preparations and specimens, and by the practice before the class of such operations, as are necessary to be performed by the keeper of stock.

John S. Newberry, M.D., Geology and Mineralogy; Botany, Descriptive and Physiological, with special reference to the history and habitudes of Plants cultivated in the Garden and Orchard, or in the Field - the various modes of Culture, and Soils adapted to each.

This department will be illustrated by specimens of all the varieties of Grains, Fruits, and other vegetable products of interest to the Farmer, Gardener, or Orchardist.

James H. Fairchild, A.M., Natural Philosophy; Agricultural Mechanics; Farm Implements; Meteorology; Elements of Engineering and Land Surveying; Rural Architecture; Landscape Gardening, and Farm Book-keeping.

Philosophical Apparatus, Implements, Models, Plans, Drawings, etc. will be abundantly provided, to aid the Lecturer in this department.

The Lectures will commence on the first Monday in December, and continue three months. Four lectures will be given daily.

Additional Facilities

A Reading Room, supplied with the principal Agricultural Periodicals, will be open to students at all hours. They will also have access to an extensive Library.

Terms

For the entire course ----- \$40.00

Board and rooms may be obtained at two dollars per week, exclusive of fuel and lights.

This Institution is designed to be permanent, and is therefore incorporated as the Ohio Agricultural College. (444)

This institution attracted few students, the largest attendance being about 40. When it became evident that it could not be maintained with private funds Dr. Townshend made an unsuccessful appeal to the State Board of Agriculture to ask the legislature to grant an appropriation of \$3,000. The school was therefore abandoned.

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For six years from 1858, and again in 1868 and 1869, Dr. Townshend was a member of the State Board of Agriculture, meantime serving as a medical inspector in the Union Army. He took an active interest in the passage of the land-grant act of 1862 and in securing the acceptance of that act by Ohio in 1864. He was elected professor of agriculture in the Iowa Agricultural College in 1869. The next year the Ohio Agricultural and Mechanical College was established at Columbus as the land-grant institution of that State but was not opened for students until Sept. 17, 1873. Dr. Townshend was a member of the board of trustees of the college at that time, but at the request of the other members he resigned to become professor of agriculture. In this capacity he served until January 1892, when he was retired as professor emeritus. He continued, however, to lecture on agriculture to students as long as he lived. The institution became Ohio State University in 1878. One of the important buildings of its College of Agriculture is called Townshend Hall.

WISCONSIN

University of Wisconsin

The University of Wisconsin was foreshadowed when Governor Henry Dodge of that Territory on October 26, 1836, in his message to the legislature recommended application to Congress for a township of land as a basis of support for one academy. ⁽⁵²⁵⁾ The legislature took no action on this matter but during this session passed an act to establish at Belmont an institution under the name of Wisconsin University. Nothing was done under this act. In 1837 another act provided for the University of the Territory of Wisconsin, with a board of 21 visitors, including the Governor, Secretary of the Territory, the judges of the supreme court, and the president of the University as ex-officio members.

Congress was asked for \$20,000 for buildings and two townships of land. An Act of Congress of June 12, 1838 gave the land, which might be located in 72 parcels. But the powers of the board of visitors were merely nominal and they did practically nothing.

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2. The second part of the report is a detailed account of the work done during the year.

3. The third part of the report is a summary of the work done during the year.

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Part of this Territory became the State of Wisconsin in 1848, under the enabling act of Congress of August 6, 1846. The State constitution of 1848 contained the following provision in Article X, Sec. 6:

"Provision shall be made by law for the establishment of a State university, at or near the seat of State government, and for connecting with the same from time to time such colleges in different parts of the State as the interests of education may require. The proceeds of all lands that have been or may hereafter be granted by the United States to the State for the support of a university shall be and remain a perpetual fund, to be called the "university fund", the interest of which shall be appropriated to the support of the State university, and no sectarian instruction shall be allowed in such university."

The constitution also made the secretary of state, treasurer and attorney-general a board of commissioners for the sale of the school and university lands of the State and for the investment of the proceeds and they were authorized to accept mortgages, with 7 per cent interest, in lieu of the purchase money. The system of investments pursued was unsatisfactory and in the end the University obtained from this source a fund of only \$150,000. To meet its necessities money was loaned to it by the State but the interest on the loans reduced the income available for educational purposes so that by 1866 the University had less than \$6,000 for its maintenance.

The State Act of incorporation of the University of Wisconsin was passed in 1848. This Act put the control of the University in a Board of Regents, consisting of a president and 12 members. The members were to be chosen by the legislature; they were to elect a chancellor, who should be ex-officio president of the board. The first meeting of the board was held October 7, 1848, but nothing was done toward the organization of the University until January 16, 1849. Madison was selected as the site of the University and 50 acres of land were purchased there. John H. Lathrop, then president of the University of Missouri, was elected Chancellor and he was installed January 16, 1850. There were then few academies in the State where students could be prepared for college and the regents therefore first established a preparatory school, which was opened in February, 1850. The first college class was formed August 4, 1850, and was instructed by the chancellor and one professor.

THE RESULTS

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The act of incorporation provided for "departments" or schools of (1) Science, literature and the arts, (2) law, (3) medicine and (4) "theory and practice of elementary instruction."

In November 1849 steps were taken to establish the first and fourth departments; the former with six professorships and the latter with a normal professorship. But insufficient funds prevented the carrying out of this plan until 1855-56 and even then the normal instruction consisted of only short courses for two years, after which they were suspended for several years. The first college class of 2 students was graduated in 1854.

On March 8, 1851, the Wisconsin State Agricultural Society was organized at Madison "to promote and improve the condition of agriculture, horticulture and the mechanical, manufacturing and household arts" and held its first fair at Janesville, October 1 and 2, 1851. At this fair the Chancellor of the University made an address in which he urged farmers to learn the theory as well as the practice of agriculture and stated that the regents intended to establish a department of the "applications of science to agriculture and the useful arts." (526)

In a conference of the executive committee of the Society with a committee of the regents "it was mutually determined that an attempt be made, at once, to procure the establishment and organization of an agricultural department in our University." In a letter of the chancellor to the Society Dec. 18, 1851, it is stated that the department of the "practical applications of science" will require at least two professorships, (1) one of chemistry and its applications to agriculture and the arts, and (2) another of "mechanical philosophy" and its applications, together with a model farm. The professor of chemistry should make geological examinations of different portions of the State, with special reference to their agricultural possibilities. This department would require \$10,000 for a laboratory and farm and \$2,500 for annual support.

THE UNIVERSITY OF CHICAGO

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In December, 1852, the chancellor wrote that the agricultural college should analyze soils, make experiments and collect statistics, as well as give instruction.

In 1854 a professor of chemistry and natural science was added to the University faculty and in 1855 Dr. Ezra S. Carr (See P.191) gave a course of lectures on agricultural chemistry and the application of science to the useful arts. The next year the executive committee of the State Agricultural Society suggested that preliminary steps should be taken to establish and endow an agricultural school and in 1857 asked the governor to recommend to the legislature "to make suitable provision for the founding of an agricultural college in connection with an ample experimental farm" and "endow the college with State lands or ask Congress for a special grant of land", such as had been made to railroads. One argument used was that if Wisconsin does not act in this matter agricultural students will go from this State to the Michigan College.

Agricultural

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A bill to reorganize the University was introduced in the legislature in 1858 but failed to pass. This proposed eight departments, including agriculture. Financial difficulties and the Civil War crippled the University. After the passage of the Federal land-grant act of 1862 there was for several years a struggle in Wisconsin over its disposal. Finally an act for the reorganization of the University was passed in 1866 and the land-grant was given to this institution. This act provided for a broad development of the University as circumstances permitted. Colleges of arts and letters were named in the act and a college of law was soon established by the regents.

"Section 2. The college of arts shall embrace courses of instruction in the mathematical, physical, and natural sciences, with their applications to the industrial arts, such as agriculture, mechanics, and engineering, mining and metallurgy, manufactures, architecture, and commerce; in such branches included in the college of letters as shall be necessary to a proper fitness of the pupils for their chosen pursuits, and in military tactics; and as soon as the income of the University will allow, in such order as the wants of the public shall seem to require, the said courses in the sciences and their application to the practical arts shall be expanded into distinct colleges of the University, each with its own Faculty and appropriate title."

THE UNIVERSITY OF CHICAGO

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THE UNIVERSITY OF CHICAGO

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The presidency of the University, which had long been vacant, was filled by the election of Paul A. Chadbourne, then president of the Massachusetts Agricultural College, but ill health compelled his resignation in 1870.

A professor of agriculture was added to the faculty in 1868 but little was done in this department until after 1881 when W. A. Henry came as professor of botany and agriculture and H. P. Armsby was made professor of agricultural chemistry in 1884, with S. M. Babcock as his successor in 1887. Then Professor Henry organized the short course in agriculture and the dairy school. (See p.573) The College of Agriculture in the University was not established until 1893.

MASSACHUSETTS

Proposal for Agricultural College in 1825.

On September 9, 1825, there appeared in the New England Farmer (vol. 4, p. 54), an article entitled "Massachusetts Agricultural College". This contained an argument and plan for such an institution with a four years' course for boys over 14 years of age, who had had a common school education. Professors of agriculture, mechanics, domestic economy, moral philosophy and "books" "seem indispensable requisites". "it will be among the duties of the last professor to give familiar lectures, in plain, impressive language, on the economy of life, the manners and morals of men, and general literature." These lectures "will be open and free to all young men who intend to make farming or mechanical pursuits the business of their lives."

Connected with the college will be a farm, with soil "best adapted to agricultural experiments." The buildings will include "mechanic workshops". The students will have "exercise at agricultural experiments, or at the mechanic arts in workshops two hours each day", together with military tactics and gymnastics. "A regular journal of the results of agricultural experiments (etc.) will be kept by the students and published semi-annually."

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An article in the same journal on October 21, 1825, favors "an agricultural professorship with each of the existing colleges", supported by State funds, which should also provide "a farm with suitable buildings and stock." The students would thus not only receive instruction in agriculture but in other branches taught at these colleges and would form acquaintances among literary men which would promote harmony among people of different occupations. All the students and visitors at the college would learn about improvements in agriculture and widely disseminate information about them. Farmers thus educated would in after life "intermingle literary pursuits with manual labor" and be "able to exert a controlling influence in legislative assemblies, and other public meetings."

This paper also records a meeting, held in Boston, November 8, 1825, "of the friends of the proposed Massachusetts Agricultural College", at which a committee was appointed to solicit funds for the college. This meeting favored a location near Boston but it became necessary to combat the views of those who, like a writer in the Franklin Post of Greenfield, Mass., argued for its location further west, perhaps in connection with established institutions, such as the Deerfield Academy. No practical result came from this effort to establish an agricultural college but the record of it shows that it raised some of the important questions which in later times were much debated in connection with the establishment of an agricultural college in Massachusetts.

That year the town of Stockbridge asked the legislature to endow "an institution best calculated to afford instruction to laborious classes in practical arts and sciences." On this matter two committee reports were made in 1826 and a third report in 1827 with a bill "to establish the Massachusetts Seminary of Arts and Sciences."

(See Massachusetts Resolves VI pp. 381, 379; also House Doc. 5 and Senate Doc. 23 of second session, 1826-27.)

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REPORT ON THE PROGRESS OF THE WORK DURING THE YEAR 1911

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The later movement, which resulted in the establishment of the State Agricultural College, centers in two men under whose leadership the movement took shape and made definite progress. These were Marshall Pinckney Wilder (1798-1886) and Edward Hitchcock (1793-1864).

Marshall P. Wilder

Mr. Wilder was born at Rindge, Cheshire County, N. H., but soon moved to Sterling, Mass. He was brought up on the farm and at the age of sixteen was offered by his father a choice between a college course, business and farming. He chose farming but soon his father's store needed him and he entered on a business career. In 1825 he became a West Indies merchant in Boston and from 1837 was partner in a commission house. For many years he was director in an insurance company and in a bank. In 1839 he was a member of the lower house in the State legislature and in 1850 was president of the State Senate. He also served as a member of the governor's council. In 1830 he became a member of the Massachusetts Horticultural Society, which had been organized the year before, and was its president from 1840 for eight years. His activity in horticulture was greatly increased after the purchase of an estate at Dorchester, Mass., in 1832. At one time he had there 2,500 pear trees of 800 varieties. He made many experiments with fruits and flowers, in connection with which he imported many varieties.

In 1848 he was one of the signers of a call for a national convention of fruit growers which resulted in the organization of the American pomological Society, of which he was the first president. He was largely instrumental in the creation of the Massachusetts State Board of Agriculture and as president of the board issued the call for a convention which formed the United States Agricultural Society, of which he was president from 1852 to 1858. (p. 308)

In 1845 he was one of the incorporators named in the act authorizing the establishment of the Massachusetts Academy of Agriculture to be located in Westborough, Worcester County, but this institution did not come into existence.

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In October 1847 the Hampshire, Franklin and Hampden Agricultural Society, at Northampton voted to "make application to the next legislature for the endowment of an Institution in the Connecticut Valley, for instruction in the various departments of agricultural science."

At the fairs of the agricultural societies in these counties that year Charles Upham Shepard, Massachusetts professor of chemistry and natural history in Amherst College, had made an address which contained a plea for an agricultural school in that region. (260) His general conception of the purposes of such an institution was shown in the following statement:

"Let land-owners here as in Great Britain, study with diligence, the principles of their art. And particularly, let them lay a broad basis for the scientific training of the rising generation. Nothing short of a thorough incorporation of the elements of the physical sciences with our system of common schools, will in the long run, answer the emergency. And for accomplishing this, there must also be established, a class of higher institutions for the preparation of teachers, as well as for the thorough education in practical farming, of individuals who have before them, the prospect of managing large estates." (260)

On January 29, 1848 Mr. Hubbard of Sunderland presented to the State House of Representatives an order "which provided that the committee on agriculture be instructed to inquire into the expediency of making provision for the establishment of a State Agricultural School, or of providing for the maintenance of an agricultural department in connection with one or more of the existing colleges of the Commonwealth." (232) Petitions favoring an agricultural school in the interior of the State were presented to the legislature early in 1848.

This movement resulted in an act in 1848 incorporating the Massachusetts Agricultural Institute, which was authorized to hold \$50,000 of real and personal estate, "for the purpose of establishing in some one of the towns lying on the banks of the Connecticut River, or in a town immediately adjoining such towns, an agricultural school and experimental farm, the object of which shall be instruction in agricultural science, and improvements in all the arts connected with the practice of farming." (232) Seven trustees were to manage the corporation, of whom two

LETTER TO THE DIRECTOR, BUREAU OF REVENUE.

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~~1878~~

were to be appointed by the Governor and Council. They were to make an annual report to the legislature "of its progress and the number of pupils, the condition of its finances, the general course of instruction adopted and pursued, and the results of its agricultural experiments."

Edward Hitchcock

Edward Hitchcock (1793-1864) was named first in the list of incorporators. He was born in Deerfield, Franklin County, spent his boyhood on a farm and afterward worked at carpentry and surveying. He early became a student of nature and theology and a writer. Ill health prevented him from taking a regular college course, though he pursued studies in chemistry and geology under Silliman, and in theology at Yale College. He was principal of Deerfield Academy (1815-1818), professor of chemistry and natural history in Amherst College (1821-1844) and president and professor of natural theology and geology in that college (1845-1854) and thereafter lecturer in his department until his death. He was state geologist in Massachusetts beginning with 1830, and from 1857 to 1861 in Vermont. He was pastor of a church at Conway, Mass. (1821-25) and at that time made a scientific survey of the western counties of the State. He was an original and forceful preacher and while president of Amherst, once preached on the text "Selah", which he interpreted to mean "Stop and think." Miss Mary Lyon was for a time a member of his family and he assisted her in the foundation of Mt. Holyoke Seminary (now College) at South Hadley. His breadth of interest in science is shown by the fact that at some time he taught chemistry, botany, mineralogy, geology, zoology, anatomy, physiology, astronomy, natural philosophy and natural theology. His interest in agriculture was shown in his institution of instruction in that subject at Amherst College and in his connection with the agricultural societies, state board of agriculture and the movement for agricultural education.

THE UNIVERSITY OF CHICAGO, CHICAGO, ILLINOIS

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THE UNIVERSITY OF CHICAGO, CHICAGO, ILLINOIS

~~1873~~

In 1849 Mr. Wilder, in an important address on agricultural education before the Norfolk County Agricultural Society, called attention to the need of an agricultural college in Massachusetts. Among those present on this occasion were Governor Briggs, Daniel Webster, Edward Everett, Horace Mann, Josiah Quincy (then president of Harvard College), Charles Francis Adams, and Governor Hill of New Hampshire.

This address aroused much interest throughout the State and on January 8 Governor Briggs, in his message to the legislature, said

"The application of science to agriculture is attracting the attention of the public, and exciting the interest of those who are engaged in the cultivation of the earth. A better knowledge of the qualities of the soil, and of the nature and properties of the substances necessary to enrich it, than has heretofore been generally possessed, would greatly increase its productions. This knowledge may be derived from science. Chemistry holds this treasure in its hands. Schools and lectures, publications and practical experiments, are the instruments through which it is to be attained. Whatever can be done to promote this desirable object, by legislative aid, is due to this most ancient and useful of all human pursuits, and that large and respectable portion of the community who are engaged in it. Content with the bounties received from the earth, this class of our fellow-citizens have hitherto received but inconsiderable contributions from the government. I cheerfully commend the subject to your favorable consideration and action." (232)

Commission on Agricultural Education

This portion of the Governor's address was referred to the joint committee on agriculture, together with petitions from the Massachusetts Society for Promoting Agriculture, and the Norfolk, Hampden, Middlesex, Worcester, and Essex Agricultural Societies. This committee reported five resolves regarding agricultural education which were adopted by the legislature and approved by the Governor, May 3, 1850. These resolves provided for a board of five commissioners to consider broadly the subject of agricultural education in its relation to the State. They read as follows:

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"Resolved, That his excellency the governor, with the advice of the council, be requested and empowered to appoint a board of five commissioners, who shall consider the expediency of establishing agricultural schools or colleges, and also of furnishing aid to any existing academy or college, for the instruction of such pupils as may wish to attend such an institution, in all those branches of agricultural knowledge necessary for the advancement of the interests of agriculture in this State.

"Resolved, That the said commissioners, if, in their opinion it is expedient to establish such agricultural school or college, shall be directed to procure plans and estimates for the buildings necessary for such an institution, and to propose and mature a system for the government thereof, with the requisite studies to be pursued at the same, and to ascertain what laws and regulations would be necessary and proper to put the same into successful operation.

"Resolved, That the said commissioners be directed to consider the expediency of establishing an agricultural and statistical department, in our state government, that shall maintain a similar relation to the interests of agriculture, and other industrial pursuits, that the board of education does to our system of common school instruction; what appropriations, if any, may be necessary, on the part of the Commonwealth, to secure instruction in this science, in our medical and other colleges, and normal schools; whether any further aid should be granted to local agricultural and horticultural societies; whether instruction in agriculture can properly be introduced into the common schools; and by what other and proper means this branch of industry, so important to the Commonwealth, and so intimately connected with the welfare of the people, may best be promoted.

"Resolved, That the said commissioners report the result of their deliberations to his excellency the governor, in season to be communicated to the Legislature at the commencement of their next session. And the said commissioners shall present all their accounts to the governor and council, to be by them audited and allowed, as they may deem just.

"Resolved, That the said commissioners consider the expediency of appropriating the property of the Commonwealth in lands, in the state of Maine, or any other available resources, to the general purposes of education, including instruction in agriculture, and to the support of charitable institutions." (246)

Hitchcock's Report on European Agricultural Schools

Wilder and Hitchcock were among the commissioners appointed under this act. The latter went to Europe, where he made a quite thorough study of agricultural institutions and prepared an elaborate report on them, with his conclusions regarding their usefulness and suggestions for a system of agricultural education in Massachusetts. (246) This report was widely circulated and had considerable influence on the movement for agricultural education throughout the country. It is, therefore, worthwhile to consider at least its more important features.

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This report contained brief accounts of 352 schools in different European countries, classified as (1) Superior, 22; (2) Intermediary, 54; (3) Inferior, 214; (4) Special, 48; (5) Connected with colleges and universities, 14. It stated that in general there was an extraordinary increase of interest in Europe on the subject of agricultural schools within a few years past. A large number of them had come into existence within ten years. They were either independent schools, or organized, in a few cases, as professorships in colleges and universities. With very few exceptions they had farms of at least a few acres of land.

The lessons Dr. Hitchcock derived from the European schools were that

- (1) they usually failed unless they received sufficient aid from the Government;
- (2) agricultural societies are not sufficient agencies for agricultural education;
- (3) theory must be tested by practice; (4) these schools are doing very much to promote the progress of agriculture; (5) to teach agriculture in primary schools and academies does some good, but is not sufficient; (6) agricultural professorships in colleges and universities are not sufficient because (a) only a few students are attracted by lectures; (b) professional and agricultural students have little sympathy with each other; (c) without such sympathy students would have no pride in the institution and therefore it would not prosper; (d) such professorships, unless numerous, would be insufficient to accomplish the objects desired; (7) agricultural institutions succeed best when started and sustained by joint efforts and contributions of individuals or societies and the government; (8) independent agricultural institutions are essential because (a) scientific and practical agriculture requires broad education in science and knowledge of literature; (b) extensive collections; (c) a large number of instructors; (d) the interests of agriculture are large enough to demand an institution devoted to their promotion; (9) reasons for agricultural schools: (a) "It is the most ready and effectual mode of making farmers understand the principles on which good husbandry is founded." (b) "These schools will furnish the most effectual means of introducing among farmers improvements in husbandry."

(c) "Agriculture, more than any other art, needs special help." (d) Our agriculture is crude compared with that of Europe.

He advocated an agricultural school or college of superior class to give education in the principles and practice of agriculture, including instruction in chemistry, zoology, botany, mineralogy, geology, anatomy and physiology, and vaterinary medicine and surgery, with a variety of collections and a "model and experimental farm" of from 100 to 200 acres.

There should also be provision for ancient and modern languages and higher mathematics as optional studies.

Such an institution would require at least six professorships: (1) Horticulture, silviculture and rural legislation; (2) Agriculture; (3) Elementary and Agricultural Chemistry; (4) Natural history and geology; (5) Anatomy, physiology and veterinary; (6) Mathematics of agriculture, including farm accounts, irrigation, draining, surveying, construction of roads, bridges, etc. By adding a professorship of technology the college might also be a school of mines, commerce and manufactures, but this was not recommended.

The course should occupy two years. For admission, English, grammar, geography, arithmetic, and five books in geometry should be required.

A number of state scholarships should be provided.

State aid should be given to academies having five acres of land and at least ten students in agriculture. A manual of agriculture should be prepared for optional use in primary schools.

The lower schools should prepare for the college.

A State Board of Agriculture, with a secretary, should be established to look after agricultural interests including agricultural schools.

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The following methods for putting this plan into operation were suggested:

(1) The State to assume the whole expense and responsibility; (2) Agricultural institute to be located near a literary institution so that students could attend scientific lectures and use collections; (3) The Board of Agriculture to aid in the establishment of the agricultural schools by appointing the president, professor of agriculture and farm superintendent, and purchasing a farm if the school was located near an existing scientific or literary institution. There should be lecturers on special subjects and one tutor for each 35 students. The State should offer funds from the sale of its lands for professors of natural science if these funds were offset by private contributions. State funds to the amount of \$3,000 annually should be spent for instruction in agriculture in the academies.

On the basis of Dr. Hitchcock's report the commissioners made the following recommendations:

1. "To carry out the foregoing views, the commissioners recommend the appropriation by the Legislature of twenty thousand dollars, for the purpose of establishing a Central Agricultural College, with a Model and Experimental Farm; said institution to be open to all classes of the Commonwealth, and in the government of which the State shall be interested so far as may be deemed expedient; provided, however, that this sum shall not be drawn for until an equal amount shall have been raised by private donation or legacy, and deposited in the treasury of the Commonwealth, to constitute a common fund for this object.

2. Whenever any incorporated Academy, not exceeding one such institution in each county, shall raise a fund of two thousand dollars or more, towards establishing and supporting a department of agricultural instruction, with lands suitable for experiments, it shall be entitled to draw from the treasury of the Commonwealth, the sum of two hundred dollars annually; provided, however, that whenever the number of scholars receiving instruction in agriculture shall be less than ten, the aid of the State shall be withheld."

3. The Establishment of a State Department of Agriculture, to consist of a board of commissioners and a secretary. This board "shall have power to locate, organize and put into operation the College contemplated by the foregoing recommendations."

4. State aid to the agricultural societies should be increased.

5. "That a premium, of such amount as the Legislature may deem judicious, be offered for the best Elementary Treatise on Agriculture, suitable for common schools; said premium to be awarded by the Board of Agriculture, if such be created, or, if not, by a committee to be appointed by the Governor or council."

6. The formation of a fund, the income of which was to be used, at the discretion of the Legislature, for the encouragement or support of institutions for instruction in agriculture, for charitable purposes, and for education. (246)

~~1851~~

In the Legislature in 1851 the report was referred to the committee on Agriculture, which reported a bill to establish a State Board of Agriculture, among whose functions might be "to receive, hold in trust, and exercise control over any donations or bequests from private sources, made to advance agricultural education." This bill did not pass.

State Board of Agriculture

Meanwhile Mr. Wilder had brought about the convention of delegates from the agricultural societies in the State, which resulted in the organization of the voluntary board of agriculture. (See p. 146) considered Among the resolutions adopted by that convention, March 20, 1851, were the following:

"Resolved, 4. That agricultural schools having been found, by the experience of other nations, efficient means in promoting the cause of agricultural education, which is so essential to the prosperity of farmers and to the welfare of communities, it becomes at once the duty and policy of the Commonwealth to establish and maintain such institutions for the benefit of all its inhabitants.

"Resolved, 5. That the several plans for an agricultural school, recently reported by the board of commissioners appointed for that purpose, are worthy the profound consideration of the people of Massachusetts, and their representatives in the General Court, as indicating the feasibility and practicability of an establishment worthy that exalted character which the State has secured by the endowment of kindred institutions, designed, like these, for the diffusion of useful knowledge among the people.

"Resolved, 8. That the convention respectfully suggests to the Legislature the propriety and expediency of reserving the entire proceeds of the sales of the public lands of the Commonwealth, - from and after the period when the Common School Fund shall have reached the maximum fixed by the Act of 1834, - for the purposes of education and charity, with a view to extending that aid and encouragement to a system of agricultural education, which the importance of the subject so imperiously demands." (232)

After considerable discussion the fourth and fifth resolutions were adopted.

When the board met September 3, 1851, a committee on agricultural education was appointed, of which Mr. Wilder was chairman, and at the meeting held January 14, 1852, the board in defining its objects in its constitution put first "the encouragement of agricultural education." Then Wilder, for the committee on agricultural education, made a report, including among others the following resolution:

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"Resolved, That Massachusetts, by an enlightened policy and wise legislation, has rendered her system of education worthy of her exalted reputation, and that this board most earnestly desire her to complete that system, by providing kindred institutions for the scientific education of the farmer, upon whom is levied so large a share of the taxes for the support of governmental and philanthropic objects." (232)

When the resolutions were adopted the executive committee was directed to present them to the legislature and urge that body to take action which would "carry into practice the principles contained in said resolutions." A memorial to the legislature accompanying the resolutions contained the following statement:

"The most important point is to lay the foundation, and to leave the development to time and experience. It may only be observed that provision for instruction by lectures, and the use of the best text books on the one hand, and for practice in an experimental farm on the other, seem to be the two great features of an institution for agricultural education." (232)

This memorial was signed by Wilder, as president of the board, and by the other officers.

The State Board of Agriculture was established April 21, 1852, and from time to time considered propositions relating to agricultural education but did nothing definite with reference to a school until January 16, 1856,

when a committee reported that "nothing would be better calculated to advance the cause of agriculture and foster and direct the growing interest therein throughout the community at large, than the immediate establishment of an experimental farm, and as soon as the funds shall permit, of an agricultural school in connection therewith, where both the science and the practice of farming may be taught in all their departments."

They also recommended that

"a committee be chosen by this Board to apply to the present Legislature for an act authorizing the formation of a board of trustees, capable of holding funds to be applied in establishing an experimental farm and agricultural school connected with it, designed to furnish instruction in every branch of rural economy, theoretical and practical."

The board appointed this committee, of which Wilder was a member.

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Massachusetts School of Agriculture

As a result the legislature that year passed an act under which Wilder and six other men were made a corporation, entitled the "Trustees of the Massachusetts School of Agriculture" for the purpose of "holding, maintaining, and conducting an experimental farm and school thereupon, with all needful buildings, library, apparatus and appurtenances, for the promotion of agricultural and horticultural art within this Commonwealth."

Concerning this movement Mr. Wilder made the following statement in an address at the Massachusetts Agricultural College, July 19, 1871:

"This plan seemed to accord better with the phase of public sentiment, and efforts were in progress for the establishment of such a school, which promised to be successful. A liberal proposal had been received from the heirs of William H. Cary, at Lexington, for the establishment of it in that town, another from the city of Springfield, where nearly forty thousand dollars had been subscribed, and an offer of the town farm and buildings had been made by the city on condition of locating the school there. * * * In their report of April, 1861, the Trustees state that they have been induced to locate the School in Springfield, and expressed the hope that they might, at no distant day, lay the foundation of the Massachusetts School of Agriculture, as one of the permanent institutions of the State." (266)

In 1860 the charter of this school was transferred to citizens of Springfield, who undertook to raise \$75,000 as a fund for its opening but the coming of the Civil War prevented consummation of this project. In 1861, however, as the result of petitions in favor of agricultural schools at Springfield, Northampton and Bernardston the legislature authorized the appointment of three commissioners "to prepare a plan for the establishment of an agricultural school or college" and this commission was continued in 1862 but took no action, pending the passage of the Federal Land-Grant Act.

The State Board of Agriculture on April 7, 1858 expressed its approval of Mr. Morrill's Federal land-grant bill and in January 1861 passed resolutions favoring the immediate establishment of "an agricultural school of high grade" and made Mr. Wilder chairman of a committee to cooperate "with any men or body of men who may have any plan for an agricultural school", and bring in a report to the Board at its next meeting.

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Massachusetts Institute of Technology

Meanwhile, the Massachusetts Institute of Technology had been incorporated as the result of a meeting in Boston, February 18, 1859, at which were present about 40 persons "representing associations of agriculture, horticulture, art, science, and various industrial, educational and more interests of the State."

Mr. Wilder presided and Professor Louis Agassiz was among the speakers. A committee appointed at this meeting memorialized the legislature in March 1, 1859, with the result that an act was passed in 1861 by which certain persons were made

a "body corporate by the name of the Massachusetts Institute of Technology, for the purpose of instituting and maintaining a society of arts, a museum of arts, and a school of industrial science, and aiding generally, by suitable means, the advancement, development and practical application of science in connection with arts, agriculture, manufactures and commerce." (232)

Massachusetts Agricultural College

On February 27, 1863 as the result of a statement by Mr. Wilder regarding the work of the committee appointed in 1861 the Board of Agriculture decided to appeal to the legislature to devote the land-grant fund principally "to the establishment of an educational institution for the practical and scientific study of agriculture, and for the instruction of youths who intend to follow industrial pursuits, and that the institution should not be immediately connected with any institution established for other purposes."

The legislature accepted the land-grant April 18, 1863 and after much discussion passed the Act of April 29, 1863, to establish the Massachusetts Agricultural College, which was to receive the proceeds of the sale of one-tenth of the land scrip for the purchase of a farm and two-thirds of the income of the fund obtained from the sale of the remaining nine-tenths. The other third of the income was granted to the Institute of Technology. There was much discussion regarding the location of the college and persistent efforts to connect it with Amherst, Williams or Harvard College. Harvard had the strongest argument for this connection in the fact that it already had the Bussey estate, on which it was obligated to establish an

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agricultural institution. Governor Andrew and Professor Agassiz were much in favor of the union with Harvard. But the legislature held out against such influences and the college was established as a separate and strictly agricultural college. It was located at Amherst but was not opened to students until 1867. (See p. 437)

VERMONT

Alden Partridge and Norwich University

Alden Partridge (1785-1854) was born at Norwich, Vt., brought up on a farm, studied at Dartmouth College and graduated at the United States Military Academy in 1806, where he served as professor of mathematics and engineering for 10 years and then was superintendent (1815-1817). In 1810 he was commissioned Captain of Engineers and resigned from the Army in 1813. In the early part of 1819 he was the engineer in charge of surveying the Northeastern boundary of the United States under the treaty of Ghent and in 1822 became surveyor-general of Vermont. Meanwhile he had become interested in general educational problems and undertook writing and lecturing on these subjects. A volume of his lectures was published in 1825. To carry out his ideas in a practical way he founded in his native town in 1819 "The American Literary, Scientific and Military Academy", which was opened for students September 4, 1820. This institution was intended to show how certain defects in the ordinary system of education might be remedied. These defects were summed up in a lecture by Captain Partridge in 1820, as follows:

"The system of education adopted in the United States seems to me to be defective in many respects: First: It is not sufficiently practical, nor properly adapted to the various duties an American citizen may be called upon to discharge. Second: Another defect in the present system is the entire neglect in all our principal seminaries of physical education, or the cultivation and improvement of the physical powers of the student. Third: Another defect in our system is the amount of idle time allowed the student. Fourth: A fourth defect is the allowing to students of the wealthier class too much money, thereby inducing habits of extravagance and dissipation highly injurious to themselves and also to the Seminaries of which they are members.

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Fifth: Is the requiring all students to pursue the same course of study.
 Sixth: Is the prescribing the length of time for completing as it is termed, the course of education. By this means the good scholar is placed nearly on a level with the sluggard, for whatever may be his exertions, he can gain nothing with respect to time, and the latter has, in consequence of this, less stimulus for exertion." (489)

From the first catalogue of the Academy we learn that:

"The course of education at this seminary will embrace the following branches of literature, science and practical instruction, viz: the Latin, Greek, Hebrew, French and the English Languages: Composition, Rhetoric, Logic, Elocution: History, Geography, including the use of maps and globes, Ethics, Metaphysics: the elements of Natural and Political Law, the Law of Nations, the Constitution of the United States and of the States severally, Military law: the elements of Chemistry, Electricity and Optics: Arithmetic, the construction and use of Logarithms, Bookkeeping, Algebra, Geometry, Plane and Spherical Trigonometry, Planometry, Sterometry, Mensuration of heights and distances by Trigonometry and also Geometrically, practical Geometry generally, including particularly, Surveying and Levelling, Conic Sections, the use of the Barometer, with its application to measuring the altitudes of mountains and other eminences: Mechanics, Hydrostatics, Hydraulics, Astronomy, Navigation, Civil Engineering, including the construction of roads, canals, locks and bridges: Architecture, Agriculture, Music."

Much stress was laid on Mathematics and the sciences relating to engineering and there was also practical field work in engineering. Captain Partridge was much impressed by the large amount of engineering work caused by the great development of roads, bridges, canals, etc. He saw that properly trained engineers would be in great demand.

Chemistry, botany, geology and mineralogy were taught in the Academy and very likely some of their applications to agriculture were pointed out. Captain Partridge also gave some lectures on agriculture, but probably these were mainly with regard to the relations of this art to Commerce and Manufactures, in a course under the general head of Political Economy.

Being opposed to a large standing army but believing thoroughly that citizens should be trained to perform military duties Captain Partridge was much interested in the organization and training of the militia. To provide officers for this citizen army he organized his Academy as a military school. His cadets not only had theoretical training and exercise in tactics but they often went on hikes

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in the vicinity of the school and sometimes on long marches or journeys. On one occasion they went, partly by public conveyance, as far as Washington, D. C. and at another time to Niagara Falls. Apparently students in this academy had plenty of physical exercise and little idle time. Captain Partridge desired to interest the navy in his enterprise and this seems to have been a reason for moving the school nearer to the seashore. In 1825 it was transferred to Middletown, Conn., and established on the site now used by Wesleyan University which still has two buildings owned by the academy. The school prospered and in 1826 had 293 students drawn from 20 States and territories and 5 foreign countries, including States as far remote as Louisiana and Michigan.

When an attempt failed to secure a charter in Connecticut which would raise the academy to collegiate grade and give authority to grant degrees, Captain Partridge gave up his school there. Returning to Norwich, Vt., he opened a preparatory school in 1827 and the academy again in 1829. To aid in this enterprise he formed in 1831 an Association for the Promotion of Useful Education, which was to prepare youth to discharge the various duties of life. This education should be non-sectarian and should deal with the application of science to the practical purposes of life. November 6, 1834, the school was chartered as Norwich University. The primary department was dropped in 1838 and a normal department begun in 1835 was discontinued about the same time. The University was then continued with collegiate, civil engineering and military science departments. A ladies' seminary was founded at Norwich by Captain Partridge in 1835 and continued several years. The young women were permitted to attend lectures at the University. Captain Partridge was president of the University until 1843, when he resigned and sold his interests in the property of the institution.

The university had difficulty in getting sufficient funds for its support and after much discussion it was finally decided in 1866 to move to Northfield, Vt., where it has since been in operation. After the passage of the Land-Grant Act of

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1862 some of the friends of the University were very desirous that it should receive the benefits of that act either by merging with the University of Vermont or becoming an agricultural college but the trustees in the end decided to keep the institution on an independent foundation.

In 1839 Captain Partridge helped to found a military school at Portsmouth, Va., and later others in several Southern States. Finally he opened such a school at Brandywine Springs, near Wilmington, Del., in 1853 but the buildings burned and before he could get established elsewhere his death occurred in 1854.

That he continued to hold the views regarding education with which he organized the academy at Norwich is shown by the resolutions adopted at a convention of his former students which he called in 1851 for establishing "The Literary, Scientific and Military system of education on a permanent basis in the United States!"

Among these resolutions is the following:

"Resolved: That, as the education of a large portion of the American youth constitutes the capital with which they must enter on the grand theatre of life, it should embrace all those branches of practical, useful knowledge that will enable them, when combined with industry and integrity, to make their way independently and usefully through the world. That, in such a course of education, Political Economy, Agriculture, the Mechanic Arts, Mental and Moral Science, Geography, Physical Philosophy and Astronomy, the use of the Barometer in calculating the altitudes of mountains, sound Literature, Laws of Nations, Mathematics, with their application to Surveying, Navigation, Civil and Military Engineering, and to the several departments of Physical Science, should occupy a conspicuous station." (489)

The history of Captain Partridge and the Norwich University is chiefly interesting to the student of agricultural education because of the views which he held so early regarding a broader and more practical education and the connecting links between him and Senator Morrill. Mr. Morrill's home was at Strafford, Vt., about 12 miles from Norwich. His partner in mercantile business from 1831 to 1855, when he went to Congress, was Jedekiah Hyde Harris (1784-1855), who was one of the incorporators of Norwich University in 1834 and a trustee until his death. This makes it quite probable that Mr. Morrill was intimately acquainted with the affairs

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of Norwich University and Captain Partridge's views on education. It may be that importance should be attached to the statement of President Charles A. Plumley that "Alden Partridge used to visit Justin Morrill when on his tramps and hiking expeditions and discussed with him his educational theories. There are many people now living who believe that the land-grant colleges have Alden Partridge to thank for having inspired Justin S. Morrill". (539)

Partridge's Memorial to Congress for funds for Educational Institutions

Captain Partridge brought his views on education to the attention of Congress in a memorial "praying Congress to adopt measures with a view to the establishment of a general system of education for the benefit of the youth of this nation." This memorial was read in the House of Representatives January 21, 1841 and laid on the table but was published as a public document. (H. R. Doc. 69, 26th Cong., 2d Session.) The essential features of his plan are shown in the following passages from this memorial:

"Your memorialist will now proceed to the system of education generally adopted at the colleges and universities in the United States -- premising that, by education, he understands the preparing of a young man, in the best possible manner, for the correct and efficient discharge of the duties of any situation in life in which interest or inclination may place him; and that, consequently, that system is best which most effectually accomplishes this object. The question then arises, does the system of education generally adopted at our colleges and universities confer on the youth who resort to them the qualifications above mentioned? Does it qualify them to become efficient and active cultivators of the soil? - that most useful and honorable occupation, by which all others are supported. Does it qualify them for the active duties of the mechanic's shop, or of the counting-house, or other of the more active duties of life? Does it qualify them to stand forth in the hour of danger as the vindicators of their country's honor, or the redressors of her wrongs, at the head of her armies, or in the ranks? Does it confer upon them that expansion of mind, and implant in their bosoms those principles of patriotism, which enable them fully to understand and duly to appreciate the excellencies and importance of our republican institutions? In fine, is it not better calculated rather to imbue their minds with a knowledge of the aristocratic and monarchical institutions of Europe, and implant in them feelings favorable to those institutions, and thus to send them forth into the world with their moral sense perverted, and their physical energies paralyzed, for want of a judicious system of physical education? If this subject be examined candidly and dispassionately, your memorialist is well convinced that the conclusion must be, that our system of education is not calculated to answer the important purposes contemplated.

* * *

Your memorialist will next proceed to propose a plan, which, if carried into practical effect, would establish a national system of education in the United States, which would be in perfect accordance with the principles of

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our republican institutions, and which would supersede the present anti-republic and monastic system. It is as follows: Let Congress pass a general law, appropriating forty millions of dollars, to be paid by annual instalments, out of the proceeds of the sales of the public lands, for the purposes of education; this money to be distributed among the States, in proportion to their representation on the floor of Congress, in such manner that the smallest States shall have at least one institution, and the largest five. The terms on which the States shall be entitled to receive money to be as follows, viz: That the Legislature of each State shall establish (either by establishing new or remodelling old institutions) such number of seminaries as it shall be entitled to, on the following plan, and embracing the following course of instruction, viz:

1. Everything of a sectarian character, in religion as well as politics, to be utterly and entirely excluded therefrom.

2. An extensive course of mathematics, theoretical and practical, with their application to civil and military engineering, and geometric operations generally, to the various departments of physical philosophy, and astronomy, navigation, etc.

3. A complete course of physical philosophy, embracing mechanics, hydrostatics and hydraulics, pneumatics, optics, chemistry, magnetism, electricity, natural history, &c.

4. Political economy, embracing the three great departments of national industry - agriculture, manufactures, and commerce; with an examination into their mutual relations, and combined effects upon the welfare and prosperity of a nation. The subjects of currency, monopolies, and labor, would necessarily be involved in the preceding.

5. The science of government generally, in its various forms, with an examination of the objects for which it is professedly instituted; and the consequences which have resulted from it, under its several forms, in different ages and in different countries. To the foregoing should be added a thorough acquaintance with the constitution of the United States, and the principles of our republican institutions generally, embracing civil administration, &c.

6. An extensive course of history, ancient and modern, of geography, &c.

7. Moral science, mental philosophy, logic, natural and political law, laws of nations, elocution, and an extensive course of ancient and modern literature; the study of the ancient and modern languages, (not excepting the English language, to which all the students should be required to give a full share of attention) to be left optional with the students, or their parents or guardians.

8. Civil engineering, embracing the construction of roads and canals, aqueducts, viaducts, locks, bridges, topographical drawing, &c.

9. Military science and instruction, embracing permanent and field fortification, artillery, the attack and defense of fortified places, the construction of batteries, sea coast and harbor defence, garrison and camp duty; tactics, including the grand and minor tactics, the schools of the soldier, platoon, company, battalion, and the evolution of the line, military drawing, &c.

10. Architecture.

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11. Each student should be allowed to progress as rapidly as possible in his studies, consistently with the thorough understanding of the same, and not be retarded, to be kept in college with such as might have less capacity, or be less studious than himself.

12. Your memorialist is well convinced that, under such a system, at the least twice as much useful knowledge would be acquired by any given number of students, in the same time, as is now acquired under the present restrictive system.

12. A course of physical education, which would preserve the health of the students, render them vigorous and active, and prevent injury to their constitution, however intense might be their application to study. Regular military exercises, including fencing, &c., would constitute the best system of physical education. These could be attended to at such hours of the day as would otherwise be spent in idleness or useless amusements, for which they would be a pleasing and useful substitute.

Such is the course your memorialist would propose should be adopted for the education of our youth, in all the higher seminaries of the United States. The proposed plan would give about eighty seminaries in the United States; and forty millions of dollars would furnish a fund of five hundred thousand dollars for each seminary. A portion of this (say two hundred thousand dollars) should be appropriated to the erection of buildings, furnishing a library, apparatus, &c.; and the interest of the balance should be applied to the payment of the professors, and to defraying the other current expenses of the institution. By this means, the charges for tuition and other collegiate expenses would be so reduced, that young men of very limited means could enjoy the benefits of the system. But, for the purpose of extending this plan, so that the great body of the people might receive its benefits, it would be necessary to make provision for the establishment of secondary institutions, much upon the plan of the "polytechnic schools" of France. The course of instruction at these institutions, although less extensive, should be conducted on the same principles as in those of the first class. Great care should be taken at these institutions to instruct the pupils in the science of government generally, and particularly to make them well acquainted with the principles of our own free institutions, which they should be taught to love, to respect, and to sustain. The whole course of instruction should be such as to form practically useful men, and calculated to develop all those manly, noble, and independent sentiments which ought to characterize every American citizen. Military science and instruction should be common to all. This is the aegis that protects a free people from foreign as well as domestic tyranny. In order to insure the advantages of the secondary class of instruction to the great body of American youth, who may wish to acquire an education of a higher order than can be obtained at the common schools, your memorialist would propose that there should be twice as many allowed to each State as of the first class; and that an additional fund of twenty million^d dollars should be appropriated, from the proceeds of the sales of the public lands, for their establishment and support. The whole number of these institutions would be about one hundred and sixty; and twenty millions of dollars for the establishment and support of each. A due proportion of this fund should be applied to the construction of the necessary buildings, and the procuring of a library, apparatus, &c.; and the balance to constitute a permanent fund, the interest of which should be applied to the support of instruction, &c."

would furnish a fund of one hundred and twenty five thousand dollars)

It is believed that this was the first definite proposition made to Congress for the use of the proceeds of the sale of public lands on a large scale for distribution to the States in proportion to their representation in Congress of new or old institutions in which there should be a broad curriculum, including the natural and economic sciences with their applications to agriculture, engineering, manufactures and commerce, as well as military science and practice in order that American youths might have an education which would make them more efficient farmers, engineers, mechanics or business men.

Among the students at Norwich University in 1860 was Henry Elijah Alvord (1844-1904), who afterwards became a major in the United States Army, military instructor and then professor of agriculture at the Massachusetts Agricultural College, president of the agricultural colleges in Maryland and Oklahoma, and Chief of the Dairy Division of the United States Department of Agriculture. He was also active in the founding of the Association of Agricultural Colleges, and was the first chairman of its executive committee and its president in 1894.

ILLINOIS

Jonathan Baldwin Turner's Plan for Industrial University

In Illinois the movement which ultimately led to the establishment of the University of Illinois, with its College of Agriculture, centers in Jonathan Baldwin Turner (1805-1898). He was born at Templeton, Mass., brought up on a farm, studied at Salem Academy and graduated at Yale College in 1833. He was a professor in Illinois College at Jacksonville, Illinois, from 1833 to 1848, when on account of failing health he returned to the farm, where he gave special attention to horticulture.

Dean Eugene Davenport has made the following interesting statements regarding him:

"As early as 1833 he became interested in the education of the masses. He literally campaigned the state in the interest of the common schools, traversing on horseback hundreds of miles of the then unbroken prairie, to awaken interest in education. It was he who sought industriously for some material to fence the prairies, in order that the people would be able to restrain their animals, live more in communities, and establish schools." (172)

For this purpose he brought to Illinois the Osage orange tree from the Ozark Mountains.

"Professor Turner found time in these days to write upon such subjects as microscopic insects, rotation of crops, and analysis of soils. He was the first man to plant corn by machinery. Almost a giant in stature, as he was in intellect, he toiled tirelessly with his hands by day and used his brain at night to write upon both philosophical and industrial subjects. He was at home with both, but his great interest lay with the masses of people and their activities. He was in touch with the greatest men of his day, both educators and statesmen, a fact well attested by his voluminous correspondence in which, as well as in his public addresses, high ground was taken regarding public questions."

"He endeavored to awaken the popular mind to the need of proper books and magazines devoted to the conditions of the working classes. In this connection, he remarked, "It is said that farmers and mechanics do not, and will not, read; but I say give them the literature and the education suited to their wants and see if it does not reform and improve them as it has reformed and improved their professional brethren. The agricultural classes have no practical congenial literature."

"He was a personal friend of Lincoln. They were boys together, and he told me personally, a few years before his death, that he and Lincoln, as young men, had discussed these very matters at intervals between lessons, when he was teaching our great President the elements of mathematics." (172)

Agricultural societies had been formed in 19 counties in Illinois when in 1841 the Union Agricultural Society covering nine counties in the northeastern part of the State was organized. This society established the Union Agriculturist and Western Prairie Farmer which in 1843 became the Prairie Farmer. The discussion of plans for agricultural education and information about what was being done in this direction in other States had a place in this journal from its beginning.

In 1848 Turner in a letter to President Blanchard of Knox College proposed that agricultural instruction should be connected with a classical school by adding professors of chemistry and botany and "a professor of what - the green earth", who should purchase and conduct an experimental farm at his own expense. After two years further consideration of this matter he was ready to propose a much broader and radically different plan. This was apparently first promoted by him at a Pike County teachers' institute and probably also at a public meeting at Griggsville,

Illinois, sometime in 1850. But its most important and complete promulgation was at a farmers' convention at Granville, Illinois, November 18, 1851.

This convention had resulted from the action of a group of Illinois farmers, who for some time had been interested in agricultural education. On February 23, 1846, these farmers, who had already been associated in an educational way for two years, met at Lowell, La Salle County, and formed the Buel Institute and agricultural society. A principal feature of this organization was the holding of an annual fair. At the fair in 1851 it was decided to hold a farmers' convention at Granville, Putnam County, in November of that year, "to take into consideration such measures as might be deemed expedient to further the interests of the agricultural community and particularly to take steps toward the establishment of an Agricultural University."

The immediate cause for this meeting was the agitation in the State regarding the disposal of the college and seminary fund, of about \$150,000 and 72 sections of land, which had accumulated from the sale of the State's public lands and the Federal land-grant in accordance with the enabling act of 1818. A considerable number of private colleges thought they ought to share in this fund, but there was strong opposition to its use for this purpose.

This meeting was attended by farmers, mechanics, professional men, and members of both houses of the legislature from various parts of the State. Professor Turner was one of the vice-presidents and chairman of the committee on business. This committee brought in resolutions which commended existing institutions "for the education of our brethren engaged in professional, scientific and literary pursuits" but held that such institutions cannot meet the needs of "the industrial classes, including all cultivators of the soil, artisans, mechanics and merchants" and therefore we should

"take immediate measures for the establishment of a University, in the State of Illinois, expressly to meet those felt wants of each and all the industrial classes of our State; that we recommend the foundation of high schools, lyceums, institutes, etc., in each of our counties, on similar principles, so soon as they may find it practicable so to do." (180)

1898

After reading these resolutions Professor Turner gave his plan for an Industrial University. The next day the convention approved this plan, and voted to seek its publication in the Prairie Farmer and other papers and to distribute 1000 copies in pamphlet form to State officers, members of the legislature and others and to secure speakers on this subject in each county and to have a committee of which Turner was chairman to call a convention at Springfield to lay this matter before the legislature at its next session and to solicit the Governor to bring the matter to the attention of the legislature. ~~An appeal to the people of the State was also provided for.~~

A broader appeal to the people of the State was provided for in the following resolution:

"Resolved, That we earnestly solicit the people of this State to meet in their primary assemblies and discuss the objects of this convention as shall be made known by our published proceedings, and join with us in asking the Legislature to grant to the people of this State, the fund which belongs to them, to aid them in establishing an institute for the industrial classes of this State, instead of dividing that fund among the different colleges, now in the State, as contemplated by those institutions." (180)

Turner's plan for an industrial university was based on the presumption that society is made up of two classes, professional and industrial.

"All civilized society is, necessarily, divided into two distinct co-operative, not antagonistic, classes: - a small class, whose proper business it is to teach the true principles of religion, law, medicine, science, art, and literature; and a much larger class, who are engaged in some form of labor in agriculture, commerce, and the arts." (180)

The professional class have ample educational institutions and facilities while the industrial class have practically none. The latter want and ought to have like facilities "for understanding the true philosophy, the science and the art of their several pursuits (their life business), and of efficiently applying existing knowledge thereto and widening its domain." "This want cannot be supplied by any of the existing institutions for the professional classes, not by any incidental appendage attached to them as a mere secondary department."

The industrial class "need a similar system of liberal education for their own class, and adapted to their own pursuits; to create for them an INDUSTRIAL LITERATURE, adapted to their professional wants, to raise up for them teachers and lecturers, for subordinate institutes, and to elevate them, their pursuits, and their posterity to that relative position in human society for which God designed them." (180)

Since the history of education shows that it is necessary to begin with the higher institutions as fountains of knowledge from which supplies of teachers, etc. can be drawn, therefore the first thing needed is a "National Institute of Science" which it is hoped will be supplied by the Smithsonian Institution at Washington, D. C.

"To cooperate with this noble Institute, and enable the Industrial classes to realize its benefits in practical life, we need a University for the Industrial Classes in each of the States, with their consequent subordinate institutes, lyceums, and high schools, in each of the counties and towns."

PLAN FOR THE STATE UNIVERSITY

"There should be connected with such an institution, in this State, a sufficient quantity of land of variable soil and aspect, for all its needful annual experiments and processes in the great interests of Agriculture and Horticulture.

Buildings of appropriate size and construction for all ordinary and special uses; a complete philosophical, chemical, anatomical, and industrial apparatus; a general cabinet, embracing everything that relates to, illustrates, or facilitates any one of the industrial arts; especially all sorts of animals, birds, reptiles, insects, trees, shrubs, and plants found in this State and adjacent States.

Instruction should be constantly given in the anatomy and physiology, the nature, instincts and habits of all animals, insects, trees and plants; their laws of propagation, primogeniture, growth and decay, disease and health, life and death; on the nature, composition, adaptation, and regeneration of soils; on the nature, strength, durability, preservation, perfection, composition, cost, use, and manufacture of all materials of art and trade; on political, financial, domestic, and manual economy, (or the saving of labor of the hand), in all industrial processes; on the true principles of national, constitutional, and civil law; and the true theory and art of governing and controlling, or directing the labor of men in the State, the family, shop, and farm; on the laws of vicinage, or the laws of courtesy and comity between neighbors, as such, and on the principles of health and disease in the human subject, so far at least as is needful for household safety; on the laws of trade and commerce, ethical, conventional, and practical; on bookkeeping and accounts; and in short, in all those studies and sciences, of whatever sort, which tend to throw light upon any art or employment, which any student may desire to master, or upon any duty he may be called upon to perform; or which may tend to secure his moral, civil, social and industrial perfection, as a man." (180)

Whether a distinct classical department should be added or not, would depend on expediency.

"To facilitate the increase and practical application and diffusion of knowledge, the professors should conduct, each in his own department, a continued series of annual experiments."

Connected with this institution should be "a botanical and common garden, orchards and fruit gardens", grounds illustrating landscape gardening and an experimental farm, with all varieties of domestic animals and useful plants appropriate to the State; suitable buildings including a repository in which useful implements and machines would be kept and tested, and an industrial library to which the professors should contribute works of their own creation.

The professors should be "men of the most eminent practical ability in their several departments" and should have a fixed tenure of office.

"Instruction, by lectures and otherwise, should be given mostly in the colder months of the year; leaving the professors to prosecute their investigations, and the students their necessary labor, either at home or on the premises, during the warmer months.

"The institution should be open to all classes of students above a fixed age, and for any length of time, whether three months or seven years, and each taught in those particular branches of art which he wishes to pursue, and to any extent, more or less. And all should pay their tuition and board bills, in whole or in part, either in money or necessary work on the premises - regard being had to the ability of each."

"At some convenient season of the year, the Commencement, or Annual Fair of the University, should be holden through a succession of days. On this occasion the doors of the institution, with all its treasures of art and resources of knowledge, should be thrown open to all classes, and as many other objects of agricultural or mechanical skill, gathered from the whole state, as possible, and presented by the people for inspection and premium on the best of each kind; judgment being rendered, in all cases, by a committee wholly disconnected with the institution. On this occasion, all the professors, and as many of the pupils as are sufficiently advanced, should be constantly engaged in lecturing and explaining the divers objects and interests of their departments. In short, this occasion should be made the great annual Gala-Day of the Institution, and of all the industrial classes, and all other classes in the State, for the exhibition of their products and their skill and for the vigorous and powerful diffusion of practical knowledge in their ranks, and a more intense enthusiasm in its extension and pursuit." (180)

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The financial support of this university should come from "the fund given to this State by the general government" and this fund should be under the control of agents representing the people of the State. A board of trustees of five persons from different parts of the State should be nominated by the Governor and confirmed by the Senate. They should have authority to add 12 members and the board thus constituted should have perpetual power to fill vacancies by a two-thirds vote. Members should be subject to impeachment by court proceedings.

This plan for an industrial university was reprinted in whole or in part in the Prairie Farmer for January, 1852, and in many other papers in different parts of the country, (including the New York Tribune and Philadelphia North American), as well as in the Report of the Illinois State Board of Agriculture and the United States Patent Office Report for 1851. Governor Augustus C. French in his message to the legislature in 1852 referred to this matter as worthy of their consideration.

In the Prairie Farmer for March, 1852, Turner proposed a grant of public lands by Congress to each State for the establishment of industrial universities in the following words: "And I am satisfied that if the farmers and their friends will now but exert themselves they can speedily secure for this State and for each State in the Union, an appropriation of public lands adequate to create and endow in the most liberal manner, a general system of Industrial Education, more glorious in its design and more beneficent in its results than the world has ever seen before."

The Granville convention appointed a committee to call another convention in Springfield during the next session of the legislature and this second convention met June 8, 1852. Friends and representatives of existing private colleges attended this meeting and much of its time was taken up in debating the use of the seminary fund. Resolutions were, however, adopted urging that this fund be used for a state institution for the benefit of the industrial classes.

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A memorial on this basis was presented to the legislature by a committee of which Turner was chairman. This contained an argument in favor of devoting the seminary fund to a single institution maintained by the State and suggested an appeal to Congress "for an appropriation of public lands for each State in the Union for the appropriate endowment of universities for the liberal education of the Industrial Classes in their several pursuits."

"In the appropriation of those funds your memorialists would especially desire that a department for normal school teaching, to thoroughly qualify teachers for county and district schools, and an appropriate provision for the practical education of the destitute orphans of the State, should not be forgotten." (180)

A third convention was held at Chicago, November 24, 1852 at which "much important business was transacted and many interesting views suggested." Turner was not present at this meeting. Leading parts were taken by Bronson Murray and John A. Kennicott, who afterwards were prominently associated with Turner in advancing this movement. It was resolved to organize "The Industrial League of the State of Illinois to raise funds for disseminating information", "keeping up a concert of action among the friends of the industrial classes" and employing lecturers "to address citizens in all parts of the State". Turner was appointed principal director of the league.

The general principles of Turner's plan for an Industrial University were approved and he was made chairman of committees to report a plan to the next convention, memorialize the legislature for the application of the seminary fund to this purpose, and prepare an address to the citizens of the State on Industrial Education and the establishment of an Industrial Institution.

At a fourth convention at Springfield, January 4, 1853, a final plan for the Industrial League was presented and approved and a charter was obtained from the State on February 10, 1853. As the result of this convention two memorials were prepared. The first was addressed to the Senate and House of the State of Illinois,

set forth the needs of an industrial university and urged that the college and seminary funds be used for the maintenance of such an institution. It also asked the legislature to petition Congress for a land-grant for industrial universities in each State. The second memorial was addressed directly to Congress and contained an appeal for a land-grant for the same purpose. The national aspects of this movement will be considered more fully in a later section of this history. (See p. 320) Meanwhile its features which were concerned especially with education in Illinois will be briefly treated.

On January 5, 1853, a meeting, in which Turner and others prominent in the university movement actively participated, was held at Springfield to organize the Illinois State Agricultural Society. This society was incorporated by the legislature January 8, 1853 and on February 11 was granted \$1,000 per annum for two years. It has taken an active part in the promotion of agricultural education.

At the session of the legislature in 1853 a bill to incorporate the Industrial University of the State of Illinois was tabled but a bill for the Northern Illinois Agricultural College became a law February 12, 1853. An act of June 21, 1852, establishing the Illinois State University was amended February 3, 1853.

On December 26, 1853, an educational convention was held at Bloomington, Illinois, which organized the Illinois State Teachers Institute, afterwards called the Illinois State Teachers Association. Turner and his associates in the Industrial League kept in close touch with this organization, which was much interested in securing state funds for a normal school.

The directors of the Industrial League decided not to antagonize the advocates of a state normal school and called a meeting at Springfield, January 1, 1855, at which a committee was appointed to draft a bill granting the college and seminary fund for Illinois University, which was to begin with a teachers' seminary and agricultural and mechanical departments.

This bill was violently attacked but was favorably reported from the senate committee and had little opposition in the house committee. The state finances became embarrassed and the bill was dropped. When the state teachers' association met at Chicago in December 1856 a letter from Turner was read in which he agreed that a normal school should be at once established, "whether we ever get an agricultural department to it or not." His plan really was to get the normal school and afterwards to unite it with the Industrial University. The result was the passage of the act of February 18, 1857, establishing the Illinois State Normal University and giving it the income from the college and seminary funds.

(For an account of the establishment of Illinois Industrial University, see p.512)

The National Movement for Education Relating to Agriculture and Other Industries.

Attention has already been called to the policy of the national government with reference to grants of public lands for educational purposes as inaugurated in the Ordinance of 1787 relating to the Northwest Territory, and in subsequent legislation relating to various new States. Washington's efforts to get Congress to establish a national university (p. 69) and a board of agriculture (p. 115) have also been mentioned, as well as Elkanah Watson's plan for such a board presented to Congress and discussed there in 1816. (p. 109)

On January 11, 1797, a committee of the House of Representatives, to which Washington's proposal for a board of agriculture had been submitted, reported in favor of establishing at the seat of government a society under government patronage whose membership would include Congress, judges, the Secretaries of State, Treasury and War, the Attorney-general and such other persons as might choose to become members under regulations prescribed by the society. This organization was to elect officers and choose a board of agriculture of not more than 30 members. Congress took no action on this proposition.

In 1838 Charles L. Fleischman, a naturalized citizen from Bavaria and a graduate of the Royal Agricultural School of that country, presented a memorial to Congress in which he described the progress of agricultural education in Europe and urged the establishment in the United States of schools in which instruction would be given in mathematics, surveying, mechanics, natural philosophy, chemistry, zoology, botany, mineralogy, geology, drawing, "the veterinary art and agriculture in all its branches." This memorial was again presented in 1839 with the suggestion that the Smithsonian fund be used for agricultural schools, which should have experiment farms and workshops. Soon after this Joseph L. Smith and others presented two memorials and a petition, which included a recommendation that the teaching of agriculture and horticulture should be introduced into the elementary and other schools.

Captain Partridge's Memorial to Congress in 1841 for the endowment of institutions for military, scientific and vocational education in all the States with the proceeds of sales of public lands, has already been mentioned. (p. 293)

The Agricultural Work of the Patent Office

Congress made the first appropriation for the promotion of agriculture in 1839 on the recommendation of Henry L. Ellsworth, Commissioner of Patents, who was an active member of the Agricultural Society in Hartford County, Connecticut. (p. 112) The Patent Office soon began the publication of articles relating to agricultural education, as well as the diffusion of practical and scientific information on agricultural subjects and the distribution of seeds.

In 1840 Solon Robinson, Agricultural Editor of the New York Tribune, and others called a convention at Washington in 1841 and organized the Agricultural Society of the United States, which held only one other meeting, May 4-5, 1842. (p. 135) A concrete object of this organization was to secure Smithson's fund "with which to establish a great school and library of agricultural science and experiment, with a garden, that should bear and be worthy of the name of Smithson." H. L. Ellsworth,

as chairman of a committee, presented a petition for this purpose to Congress, which was laid on the table. The establishment of the Smithsonian Institution in 1846 turned that fund in other directions.

The Patent Office Report for 1845 contains the address to the people of the United States prepared by a committee, of which Mr. Robinson was chairman, at the third national "convention of farmers and silk culturists" held under the auspices of the American Institute of New York. The interest of the convention in agricultural education is shown in the following paragraph from this address:

"It is one of the objects of this convention to seek out a way by which the condition and character of the cultivators of the American soil can be elevated and improved. For this purpose we recommend the extensive formations of farmers' clubs, and largely increased reading of agricultural papers and other valuable publications, which have, of late years, been so extensively multiplied for the farmer's use. We also recommend most earnestly to all our common as well as higher schools to adopt, as an unvarying branch of education, subjects calculated to impress upon the minds of the young the necessity of applying science to the cultivation of the earth, and that it is the original and most honorable, as well as the most happy and healthy of all employments. We also recommend that an earnest appeal be made to Congress to adopt at once the recommendation of our father, Washington, and establish a 'Home Department' for the encouragement and support of the agricultural interests of our country. In aid of these views we offer the following resolution:

Resolved, That the American Institute, by whose co-operation this convention was called, be requested to continue their noble efforts in the cause of agricultural movement, by adopting measures to have this matter brought before the next meeting of Congress."

In 1848 a memorial was presented to the United States Senate by John S. Skinner, asking for "an appropriation, to be applied, under the direction of the state governments * * * to the establishment of institutions for instruction in geology, mineralogy, and vegetable and animal physiology; in civil engineering, as applied to roadmaking, bridge building, and other rural architecture; and also to instruction in the mechanical principles on which depend the labor-saving properties and efficiency of agricultural implements and machinery."

Dr. Daniel Lee in the Patent Office Report for 1850 advocated that Congress "establish an institution of the scientific grade of West Point Academy and procure such gentlemen as Liebig and Boussingault to serve as teachers until a reasonable

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number of talented Americans could be prepared to fill professorships in State agricultural colleges." The Report for 1851 contains a letter from Harvey Dodge recommending the establishment by Congress of a large agricultural institution, with smaller schools in each State.

The United States Agricultural Society

On January 14, 1851 the Massachusetts Board of Agriculture under the influence of Marshall P. Wilder, ^(p. 277) its president, asked him to correspond with State and other agricultural associations on the expediency of calling a national agricultural convention. In responding to this call the Pennsylvania and Maryland societies declared in favor of making the convention a means for the establishment of a national agricultural society. A call for the convention was issued May 20, 1852, by Wilder, representing the Massachusetts Society, and the presidents of associations in Pennsylvania, Maryland, New York, Ohio, Indiana, New Hampshire, Vermont and Rhode Island. 152 delegates from 23 States and Territories met at the Smithsonian Institution, Washington, D. C., June 24, 1852. Daniel Webster, "the Marshfield farmer", attracted much attention as a delegate. Mr. Wilder presided and on motion of Daniel Lee, editor of the Genesee Farmer in New York, but then connected with the Patent Office in Washington, it was voted to form a national agricultural society. A constitution was adopted in which the organization was named "The United States Agricultural Society". Going back to the suggestion of the Congressional committee in 1797, the society incorporated in its constitution a proposal to form within itself a board and of agriculture of 3 members from each State, Territory and the District of Columbia.

"It shall be the duty of this Board to watch the interests of agriculture as they are or may be affected by the legislation of the country; to make such reports, memorials and recommendations, as may advance the cause of agriculture, promote and diffuse agricultural knowledge; to examine, and when necessary, report upon the practicability of establishing agricultural schools, colleges, and model farms; to set forth the advantages of agricultural and geological surveys, and to show the importance of the application of science to agriculture; to represent through their reports the relation of American agriculture to that of foreign countries, and endeavor to obtain information from such countries; to point out the advantage of introducing any new staples, seeds and plants, and obtain, so far as practicable, annual statistical returns of the condition of

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agriculture throughout the different States; all which information shall be published by the Society, and form part of its transactions." (109)

This Board never actually came into existence but the Society itself acted to a considerable extent in that capacity. Wilder was elected president of the Society. He continued in this office six years and actively promoted the work of the society.

The Society undertook the publication of a Journal. The first volume appeared in 1852 and was prepared by Daniel Lee. The influence of the Society was also widely extended by the exhibitions held in succeeding years in Massachusetts, Ohio, Pennsylvania, Kentucky, Virginia and Illinois.

A prominent member of this Society during its first five years was George Washington Parke Custis of Virginia, who as early as 1810 had published in the National Intelligencer and also in pamphlet form a plan "for a national agricultural organization, to be incorporated with the government and attached to a national university."

At the meeting in 1852 there was a long discussion on a proposition to ask Congress to establish an agricultural department in the Federal Government. Among other objections to this plan was the thought that this new society through its board of agriculture could function sufficiently for the national promotion of agriculture and this was further brought out in 1853 when the Society asked Congress to give it part of the money before appropriated to the Patent Office. A compromise resolution was finally adopted in which Congress was simply asked "to take action upon the subject of agriculture and afford such efficient aid" as they deemed best. This, however, was not altogether satisfactory and after a few months' reflection the Society at its meeting February 2, 1853 adopted a resolution favoring a Department of Agriculture with a cabinet officer at its head and this action was reaffirmed at later meetings.

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Illinois Memorial to Congress for Land-grant for Industrial Universities

Turner's plan for industrial universities was brought to the attention of the Society by Richard Yates, then a Congressman from Illinois, who had been one of his students. Yates was also interested in the establishment of a Federal Department of Agriculture and wanted to make Turner its head.

In 1851 and 1852 Turner's plan for an industrial university in each State attracted wide attention throughout the country and this interest was intensified by what resulted from the adoption by the second Illinois farmers' convention in 1852 of the following paragraph:

"We desire ^{prudent} that some beginning should be made as soon as our statesmen may deem ^{so} to do, to realize the high and noble ends for the people of the state proposed in each and all of the documents above alluded to, and if possible on a sufficiently extensive scale to honorably justify a successful appeal to Congress in conjunction with eminent citizens and statesmen in other states who have expressed their readiness to co-operate with us for an appropriation of public lands for each state in the union for the appropriate endowment of universities for the liberal education of the industrial classes in their several pursuits in each state in the union."(180)

This was followed up by the third and fourth conventions and by the Industrial League of the State of Illinois under Turner's leadership. On February 8, 1853, the governor of Illinois approved the following resolutions unanimously passed by both houses of the legislature:

"Whereas, The spirit and progress of this age and country demand the culture of the highest order of intellectual attainment in theoretic and industrial science: And whereas, it is impossible that our commerce and prosperity will continue to increase without calling into requisition all the elements of internal thrift arising from the labors of the farmer, the mechanic, and the manufacturer, by every fostering effort within the reach of the government: And whereas, a system of Industrial Universities, liberally endowed in each State of the Union, co-operative with each other, and the Smithsonian Institution at Washington, would develop a more liberal and practical education among the people, tend the more to intellectualize the rising generation, and eminently, conduce to the virtue, intelligence and true glory of our common country, therefore, be it

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Resolved, by the House of Representatives, the Senate concurring herein, That our Senators in Congress be instructed, and our Representatives be requested, to use their best exertions to procure the passage of a law of Congress donating to each State in the Union an amount of public lands not less in value than five hundred thousand dollars, for the liberal endowment of a system of Industrial Universities, one in each State in the Union, to co-operate with each other, and with the Smithsonian Institution at Washington, for the more liberal and practical education of our industrial classes and their teachers; a liberal and varied education adapted to the manifold want of a practical and enterprising people, and a provision for such educational facilities, being in manifest concurrence with the intimations of the popular will, it urgently demands the united efforts of our national strength.

Resolved, That the Governor is hereby authorized to forward a copy of the foregoing resolutions to our Senators and Representatives in Congress, and to the Executive and Legislature of each of our sister States, inviting them to co-operate with us in this meritorious enterprise." (180)

Horace Greeley, who as already stated (p. 225) was vitally interested in the People's College, in New York, commented editorially on these resolutions in the New York Tribune of February 26, 1853, as follows:

"It may now be ten years since a few poor and inconsiderable persons began to 'agitate' in favor of a more practical system of thorough Education, whereby youth without distinction of sex should be trained for eminent usefulness in all the departments of Industry.

They demand seminaries in which Agriculture, the Mechanic Arts, the Management of Machinery, etc., should be thoroughly taught, based upon a knowledge of Chemistry, Geology, Botany, Hydraulics, etc., with a corresponding proficiency in all that pertains to Housewifery and Household Manufactures for female pupils. These demands made very little immediate impression on the public mind. They were backed by no great names, and no imposing array of Colonels, Generals and Honorables was ever presented in the reports of the agitators' meetings. In fact those meetings, proffering no chance for making personal or political capital, and holding out no prospects of snug berths to be provided for cousins and younger brothers, have always been but thinly attended. The only class feeling a deep interest in them was that one which could least afford the time and expense involved in attendance on distant Conventions. And the great majority of the journals have not to this day, evinced a consciousness that any such movement had an existence.

Still, the idea has slowly gained ground wherever a few faithful advocates were found to cherish it, and several small conventions of its friends have been held in this State, looking to the foundation of a 'People's College'; and the project has elicited the marked approval of Gov. Hunt and Gov. Seymour. Two State Conventions have in like manner been held in Illinois - the last some few weeks ago - and one result of these is the passage by the Legislature of that State of the Joint Resolution [cited above].

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Here is the principle contended for by the friends of Practical Education abundantly confirmed, with a plan for its immediate realization. And it is worthy of note that one of the most extensive of the Public Land (or New) States proposes a magnificent donation of Public Lands to each of the States, Old as well as New, in furtherance of this idea. Whether that precise form of aid to the project is most judicious and likely to be effective, we will not here consider. Suffice it that the Legislature of Illinois has taken a noble step forward in a most liberal and patriotic spirit, for which its members will be heartily thanked by thousands throughout the Union. We feel that this step has materially hastened the coming of Scientific and Practical Education for all who desire and are willing to work for it. It cannot come too soon."

The memorial to Congress from the Illinois legislature was presented in the House of Representatives at Washington, March 20, 1854, by Elihu B. Washburne and in the Senate by James Shields, where it was referred to the Committee on Public Lands. The breadth of interest in this matter is indicated by a letter from San Francisco, May 11, 1854, to Mr. Washburne, which was written "at the instance of a large assembly of farmers, machinists and artificers now operating on the Pacific Coast" and which commended him for his "vigilant attention" to the Illinois resolutions. Congress, however, took no action on these resolutions.

On April 14, 1854, Richard Yates asked Turner to prepare a bill embodying his plan, which he did but it was not deemed wise to introduce it at that session. Yates was not reelected and nothing further was done in Congress with this matter during the presidency of Mr. Pierce. He had shown his opposition to land-grants by vetoing in 1854 a bill carrying such a grant for the support of the indigent insane and it was not probable that he would be favorable to grants for education.

The United States Agricultural Society took no immediate action with reference to the proposal of the Illinois farmers regarding industrial universities. At its meeting February, 1854, a committee of the Maryland State Agricultural Society called attention to their plan for a national agricultural department, with instructors, library, cabinet and apparatus, to be attached to the Smithsonian Institution for the study of the science of agriculture. This also involved a proposal for the purchase of the Mt. Vernon estate for a national experimental farm. This latter proposal was favored by the United States Society, which appointed a committee to present it to Congress.

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This project is probably referred to in the "Congressional Globe" where it is stated that on December 7, 1853, Mr. Lyon, of New York, gave notice that "he would ask leave to introduce a bill for the establishment of a National Agricultural College and Experiment Farm". No practical result came from this movement.

At the meeting in 1854 the society's interest in agricultural education was further stimulated through an address by Professor Fox, who was then teaching agriculture in the University of Michigan. In 1856 Turner's Illinois organization, which was still seeking a land-grant act from Congress, asked the aid of the Society for this measure. A difficult situation was thus created in the society, illustrating how such a proposition excited sectional animosities growing out of the existing political situation, which was finally to result in the Civil War. This was one of the things with which Mr. Morrill had to contend in connection with his first land-grant bill and which probably led to the course he pursued in avoiding extended discussion of his bill on the floor of Congress. The South was so predominantly agricultural that on many accounts it would have seemed easy and natural for public sentiment and political leaders there to favor a measure likely to result in Federal grants for agricultural education. But at that time the South felt very strongly that anything was inimical to its interests which even to a slight extent imperilled the doctrine of States rights, considered as a thing absolutely necessary to the maintenance of its social and industrial life.

Therefore the committee appointed by the United States Agricultural Society to consider the Illinois proposition brought in majority and minority reports. Professor Henry of the Smithsonian Institution and Mr. Byington of Connecticut, who signed the majority report, favored the proposition but Mr. DeBow of Louisiana in the minority report strongly opposed it. When it became evident that harmony could not be brought about on this proposition, the matter was then laid over to the next annual meeting, when a favorable resolution was passed with a majority of only 3 members. The Society in 1857 thus took about the same position as Congress did in dealing

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with Mr. Morrill's first land-grant bill which was passed in the House of Representatives April 20, 1858, with a majority of 5 votes and in the Senate February 2, 1859, of 3 votes. It was vetoed by President Buchanan as contrary to the Constitution.

(See p.353)

Meanwhile Turner and his associates were active in disseminating information and arousing interest regarding the proposal for federal endowment of industrial universities. President Cary of the Farmers College, near Cincinnati, Ohio, brought about the Northwest industrial convention September 13-15, 1854 at which a number of States were represented. Turner was unable to go but the Illinois league was represented by Bronson Murray. A paper by Turner was furnished for the proceedings, an account of which was published in the Prairie Farmer for October, 1854. President Hapman of the University of Michigan approved federal aid for education and on his invitation Turner addressed an educational meeting at Detroit in August, 1856.

Turner, Kennicott and Murray also had correspondence with influential individuals and societies in Iowa, Minnesota, Oregon, and other States between 1854 and 1857.

When the presidency of the United States passed to Buchanan in 1857, the friends of Federal land grants for industrial universities decided to bring this matter again to the attention of Congress. On October 7, 1857, Turner wrote Senator Lyman Trumbull of Illinois that "in conversation with Senator Douglas on the cars the other day he expressed his opinion that such a grant could be obtained at the next session." Turner followed this up by sending Douglas a copy of the pamphlet on Industrial Universities, the receipt of which was favorably acknowledged October 12, 1857. Senator Trumbull wrote Turner October 19, 1857 as follows:

"Since the receipt of your letter I have re-read the pamphlet in regard to industrial universities. The idea is a grand one, if it could be carried out and made practical. I thought I saw in the last congress an opposition springing up against any further grants of land in the States, but perhaps it was confined to those made to new States, and your project contemplating a grant to all the States might meet with more favor. Several large grants were made last year, but it was done grudgingly. For my own part I have been favorable to an early

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disposition of the public lands by the general government, and if they could only be secured to actual settlers, I would be glad to see it divested at once of this great source of patronage and corruption. If some of the old States would take hold of the matter, I think it not unlikely that a grant of lands might be obtained from Congress; but coming from the new States, which have already obtained such large grants for schools and other purposes, it would be likely to meet with less favor." (170)

Justin S. Morrill of Vermont entered the Federal House of Representatives December 4, 1855, and was a delegate to the meeting of the United States Agricultural Society in February 1856, at which the Illinois plan for a Federal land-grant for universities was discussed. On February 28, 1856, Mr. Morrill showed his interest in agricultural education by an unsuccessful attempt to introduce in Congress a resolution that the "Committee on Agriculture be requested to enquire into the expediency of establishing one or more national agricultural schools." Just what happened between this action on his part and the introduction of his land-grant bill December 14, 1857, is not positively known.

Mrs. Mary Carriel, Turner's daughter, in her biography of her father, has stated that after his receipt of the letter of October 19, 1857, from Senator Trumbull, "it was decided to send all documents, papers and pamphlets to Mr. Morrill with the request that he introduce a bill. This at first he was reluctant to do, but after much persuasion he consented." (170)

This is substantially confirmed in a statement which Dr. Burt E. Powell, in his Semicentennial History of the University of Illinois, claims was made to him by Rev. J. R. Reasoner of Urbana, Illinois, "that at one time he had a long conversation on the subject of the land-grant act with Jonathan Turner, who told him that he had taken the matter of having the bill introduced in Congress to Mr. Morrill." (182) No evidence has yet been produced to show whether Turner, himself, corresponded with Mr. Morrill or sent the papers in this case to some Illinois representative for transmission to Morrill.

On the other hand Mr. Morrill never admitted that he had received such papers but on the contrary several times stated regarding his college land-grant bill that

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he did not know where he received "the first hint of such a measure." This matter is more fully discussed in a later section dealing with the history of the Land-grant act of 1862. (See p. 319)

Part III.

The Morrill Land-Grant Act of 1862 and the Early Work of the
Land-Grant Colleges, 1860-1887.

PART III

The Morrill Land-Grant Act of 1862 and the Early Work of the Land-Grant Colleges, 1860-1887.

The author and successful promoter of the Land-Grant Act of July 2, 1862, was Justin Smith Morrill, then representative in Congress from Vermont. He was born at Strafford, Vermont, April 14, 1810, being the eldest son of Nathaniel and Mary (Hunt) Morrill. His father was a blacksmith but he was also able to build a dam across the Ompompanoosuc River. His shop was equipped with a trip hammer, grindstone and blower and he made axes, hoes and scythes. Like many mechanics in his time he owned and operated a farm. There Justin among other things helped his mother by churning milk and afterwards acknowledged that he thus learned that perseverance which enabled him to secure the passage of his land-grant bill. For when the butter did not come easily his mother made him stick to his task until the desired result was accomplished.

Strafford was a village of about 20 houses and it had only a small red schoolhouse. When he had completed the elementary course there Justin went one term to Thetford Academy and another term to Randolph Academy. When at the age of 15 years, after considering further preparation for college, he took the advice of the leading citizen of Strafford, Judge Jedekiah H. Harris, and entered on the career of a merchant because he was told that thus he might be "more sure of an independence". He worked first for six weeks in the store of Royal Hatch at Strafford and then in that of Judge Harris, who paid him \$45 for the first year and \$75 for the second. When 18 years old he went with a cousin to Portland, Maine, where his uncle, Dr. Jacob Hunt, resided. After two years in business there he returned to Strafford where he was engaged to sell out the stock of a mercantile firm. In 1834 he accepted a proposition made by Judge Harris and became his partner. Their business expanded until they had four stores, one of them being 80 miles away at Derby Line near Canada. Six years later the firm of Morrill, Young & Co. was formed and by 1848 this and other

business undertakings of Morrill had proved so successful that he retired and settled down to manage a small farm.

Meanwhile he was beginning to take another cue from his friend Harris, who was much interested in politics and whose store was long a forum for political discussions. As early as 1844 Morrill was chairman of the Orange County Whig Committee; then he became a member of the State Committee of that party in 1848 and delegate to its National Convention at Baltimore in 1852. Two years later he was elected a Congressman from Vermont by a plurality of only 59 votes, the closeness of the contest being due to a split in the Whig party caused by the Free-soil movement. This led in 1855 to the formation of the Republican party, which in Vermont, was aided by Morrill. It is not within the purpose of this work to follow in detail Mr. Morrill's legislative career, but a brief statement regarding some of his most important services in Congress may serve to show the character of that career.

In the House of Representatives he was first a member of the Committee on Territories, and then on Agriculture. In 1858 he was honored with appointment to the great Committee on Ways and Means. In that capacity he became the author of the Tariff Bill of March 2, 1861, and though he had previously declined the chairmanship of the Committee in favor of Thaddeus Stevens, he was raised to that position in 1865. The next year he was elected Senator and served in that body until his death on December 28, 1898. As chairman of the Committee on Finance he was the author of the Tariff Bill of 1883. As a member and afterwards chairman of the Committee on Buildings and Grounds he was greatly interested in securing the erection at Washington of suitable public buildings. His greatest achievement in this matter was the passage of his bill for the magnificent building in which the Library of Congress is housed. On this measure Morrill worked for 14 years.

He was distinguished for his great industry as a member of Congress.

He made over 100 formal speeches and through these and by resolutions, petitions, motions or suggestions he appears in the Congressional Record 2,477 times. His spirit of friendliness and his conciliatory attitude toward his opponents contributed much to his success in both private and public life.

When as a youth he gave up an engagement to teach a district school at \$11 a month to enter on a mercantile career he did not lose his interest in education. In 1827 he started a subscription for a town library and thereafter read Blackstone's Commentaries, Milton, Addison, Sam Johnson, Goldsmith and other standard literature. On his return from Maine to Strafford he formed a debating society. He also wrote anonymously for the papers. He was asked to be a trustee of Norwich University in 1848 but declined because he did not like certain policies of the institution. His marriage in 1851 to Ruth Barrell Swan, daughter of Dr. Caleb Swan of Easton, Mass., undoubtedly promoted his interest in education since she had been a teacher and was familiar with the educational movements of that time.

Through his life in his early home where mechanic arts was combined with agriculture, through his efforts to increase his own education, through his association with Judge Harris who was vitally interested in Norwich University, and through the intelligent interest of his wife in educational matters Mr. Morrill was prepared to undertake the great educational tasks involved in the formulation and passage of the land-grant act of 1862 and the supplementary act of 1890.

The Origin of the Morrill Land-grant Bill

During the first session of the 34th Congress, on February 28, 1856,

Mr. Morrill introduced the following resolutions:

"That the Committee on Agriculture be requested to enquire into the expediency of establishing one or more national agricultural schools upon the basis of the naval and military schools, in order that one scholar from each Congressional District and two from each State at large may receive a scientific and practical education at the public expense."

This resolution was objected to by Mr. Keitt of South Carolina and was not received.

Meanwhile Turner's plan for industrial universities was being kept alive. Attention has already been called (see p.312) to the meetings in Washington in 1856 and 1857 when the United States Agricultural Society had this plan under consideration and finally endorsed it by a small majority. Mr. Morrill was a delegate from Vermont to both of these meetings. The published transactions of the society do not show that he took any part in the discussion of Turner's plan. Marshall P. Wilder presided at both of these meetings. Horace Greeley, trustee of the People's College in New York, was a delegate to the 1856 meeting. It seems probable that Mr. Morrill knew about Turner's proposition even if he took no part in discussing it. Something must have happened which led Mr. Morrill to bring forward a bill differing materially in its purpose from that indicated in his resolution above cited.

In the biography entitled "The Life and Services of Justin Smith Morrill", by William Belmont Parker, published in 1924, is a copy of a paper prepared by Mr. Morrill, "apparently in 1874", which contains the following statement of his purpose in preparing and introducing the land-grant bill:

"The idea of obtaining a land grant for the foundation of colleges I think I had formed as early as 1856. I remember to have broached the subject to Hon. William Hebard, the former member of Congress from the 2d District, and he observed that such a measure would be all very well, but that of course I could not expect it to pass. Where I obtained the first hint of such a measure, I am wholly unable to say. Such institutions had already been established in other countries and were supported by their governments, but they were confined exclusively to agriculture, and this for our people, with all their industrial aptitudes and ingenious inventions, appeared to me unnecessarily limited. If the purpose was not suggested by the well-known fact of the existence of Agricultural Schools in Europe it was supported by this fact and especially by constant reflections upon the following points, viz:

First, that the public lands of most value were being rapidly dissipated by donations to merely local and private objects, where one State alone might be benefitted at the expense of the property of the Union.

Second, that the very cheapness of our public lands, and the facility of purchase and transfer, tended to a system of bad-farming, or strip and waste of the soil, by encouraging short occupancy and a speedy search for new homes, entailing upon the first and older settlements a rapid deterioration of the soil, which would not be likely to be arrested except by more thorough and scientific knowledge of agriculture and by a higher education of those who were devoted to its pursuit.

Third, being myself the son of a hard-handed blacksmith, the most truly honest man I ever knew, who felt his own deprivation of schools (never having spent but six weeks inside of a school-house), I could not overlook mechanics in any measure intended to aid the industrial classes in the procurement of an education that might exalt their usefulness.

Fourth, that most of the existing collegiate institutions and their feeders were based upon the classic plan of teaching those only destined to pursue the so-called learned professions, leaving farmers and mechanics and all those who must win their bread by labor, to the haphazard of being self-taught or not scientifically taught at all, and restricting the number of those who might be supposed to be qualified to fill places of higher consideration in private or public employments to the limited number of the graduates of the literary institutions. The thoroughly educated, being most sure to educate their sons, appeared to be perpetuating a monopoly of education inconsistent with the welfare and complete prosperity of American institutions.

Fifth, that it was apparent, while some localities were possessed of abundant instrumentalities for education, both common and higher, many of the States were deficient and likely so to remain unless aided by the common fund of the proceeds of the public lands, which were held for this purpose more than any other.

Upon these points and some others I had meditated long and had delved in more or less statistical information, convincing to myself but not the most attractive for a public speech, as I have often found such data, indispensable as it is to the basis of most of our legislative measures, less welcome than even very cheap rhetoric interesting to few and entertaining to none. Discreet legislators cannot get on without reliable facts.

Certainly I was not clear that I could succeed in carrying through Congress the College Land Bill, but I had nearly determined to attempt it, and, like a young lover after the engagement, I sought the advice of some of the old members of the House and Senate, who almost uniformly said: "You can try, but of course it is of no use." This would have killed the project if they had not in many instances immediately added, "It would be a grand measure, however, and so far as my vote is concerned you shall have it." (494)

Mr. Morrill also claimed complete authorship of this bill in various statements made in later years.

It is hard to believe that Mr. Morrill knew nothing about what was going on in this country with reference to agricultural and technical colleges. Leaving out of account Turner's special efforts to get before Congress his plan for industrial universities, the plans for the People's College and the State Agricultural College in New York, the Michigan Agricultural College,

the Farmer's High School in Pennsylvania, Mr. Wilder's efforts to get an agricultural college in Massachusetts, etc. were being published in the agricultural press and in other ways. Petitions were constantly coming to Congress for land-grants for agricultural colleges in different States.

Mr. Morrill must have known about Captain Partridge's memorial to Congress in 1841, and he knew about Norwich University. The mere fact that his father was a blacksmith would hardly have been sufficient to have led him to formulate a plan which so closely resembled the People's College, and Turner's Industrial University.

Why he did not refer to American sources of information about agricultural and technical schools as having had anything to do with the formulation of his bill we cannot tell. But it would not be creditable to Morrill to suppose that he did not know about them. His statement of his reasons for making the bill is peculiarly personal. It may be true that he personally did draft his bill and he deserves very great credit for its form and for the masterly way in which he brought about its passage. That his bill was not a copy of a bill given to him by Turner or his friends is indicated by the statement of Turner after the Morrill bill was introduced that it needed amendments. Morrill's measure was in fact the culmination of the long movement for agricultural and technical schools, as shown in a previous chapter of this history and it is altogether likely that Morrill derived the ideas incorporated in the bill from various sources connected with that movement.

Morrill's Account of the Congressional Proceedings relating to his
Land-Grant bill.

Mr. Morrill in his statement of 1874 above cited acknowledged the help of a number of persons in securing the passage of the land-grant bill, as follows:

1955-56

1956-57

1957-58

1958-59

1959-60

1960-61

1961-62

1962-63

1963-64

1964-65

1965-66

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1981-82

1982-83

1983-84

"To learn how much support could be relied upon in Congress to sustain the bill, I was diligent in pushing inquiries through some friendly sources as to how the delegations from each State would vote when the bill should come to be finally reported. In this labor Mr. Walbridge of Michigan, a member of the Committee on Public Lands, was also active, as were several other of my friends. We daily gained hope. Soon after the introduction of the bill, the Reverend Amos Brown, President of the People's College at Havana, New York, having read the account in the newspapers, wrote to me and then came to Washington, where he entered very zealously into canvassing for votes for the bill - particularly among the New York members. He was not only a willing worker, but discreet about exciting hostilities where he was unable to secure favor. Arad Joy, who had endowed the People's College, took an interest in the bill, and I presume paid the board bill and traveling expenses of Mr. Brown, who remained at different times for several weeks and unquestionably expected New York would assign some share to their College of whatever might be obtained. Horace Greeley was one of their trustees and the 'Tribune' showed some favor to my bill, through a cordial notice by its regular correspondent, James E. Harvey, afterwards our Minister at Portugal, who declared it the most important measure which had been introduced in Congress for many years and generously bestowed his compliments when I came to make a speech in support of the bill.

In the Senate Mr. Pearce, of the Eastern shore of Maryland, promised his aid, but it never became very conspicuous. He was an accomplished gentleman, the owner of a few slaves, out of whom he said he could get no work, and while boarding with him on 4th Street, I found his society extremely agreeable, making some deductions for spurts of temper, for his too great love of money and his aristocratic bearing. Mr. Crittenden of Kentucky gave the bill a quick welcome - it seemed to have a relationship to the measures of his old colleague, Henry Clay. I had only met him on a few social occasions, and when I brought the subject to his attention one day upon strolling into the Senate, I shall never forget his hearty Kentucky cordiality. I had marched as a delegate in 1844 with his sons in the Baltimore Whig Convention. That was enough. In my presence he exclaimed to another Senator, 'You know there is no measure Mr. Morrill could ask for that we should not gladly support. Mr. Morrill has our hearts.' Mr. Foot of Vermont was always eager to forward any good work and his colleagues never sought his aid in vain. He made few speeches in the Senate, where he long presided, but his personal influence was potential and he never had a friend for whom he would not exert it.

But the first effort was to get the measure through the House, and even to get it out of the committee was a perplexing labor. A majority there was against the bill, and they might strangle it by not reporting, although they entertained no doubt that it would be killed by the House as soon as it could be reached. At last we found one member who, though he would vote against the bill, was willing to treat it fairly by reporting it adversely and in season for some action by the House. Then there was a difficulty in obtaining the attendance of every member who favored the bill - all being necessary, but after many weeks this was accomplished and the Chairman prepared his adverse report accordingly. It then devolved upon Mr. Walbridge to make a report in behalf of the minority in favor of the bill, and although he could make an off-hand speech with considerable spirit, he acknowledged that he could not write a report and called upon me to supply one. I told him that when the bill should be reported, I proposed to make a speech upon it and that I preferred not to exhaust my ammunition. Besides, I thought it might better come from some other source, therefore he ought to apply to some one else, and he did apply to the President of the Agricultural College of Michigan, who furnished at once an able and elaborate account of European Agricultural Colleges, to which at his earnest solicitation I furnished a few concluding pages. It was

rather funny that Mr. Walbridge should tell me next year that this report - not a word of it being his own - had given to him a great reputation at home and made him at one time a formidable candidate in his State for the United States Senate!

* * * * *

When the bill went to the Senate it was referred to a committee and reported back by the Chairman, Senator Stuart of Michigan, May 6, 1858, without any recommendation. But one member of the committee, then absent, subsequently returned and gave in his assent, so that finally it had the support of a majority of the committee. It failed to be acted upon by the Senate, however, until the next session, when it called forth a good deal of discussion. Senator Stuart, Democrat as he was, sustained the bill very handsomely, but Southern Democrats assailed it with much bitterness. Mason of Virginia and Clay of Alabama made long speeches against it. Douglas voted for it, but did not enter into the debate. Judge Collamer made a clear and strong constitutional argument in support of the bill, enlivened by one of his quaint stories of the man who cheated in maple sugar by watering his sap, and Mr. Harlan also made an argumentative speech, crammed with facts in its behalf. His State, Iowa, had instructed their Senators to vote for the bill, as had Vermont and many other States. So the delay of the Senate was perhaps not without some advantage. Mr. Wade at length took charge of the bill and with little talk himself, though that was always pungent, succeeded in obtaining a vote of the Senate, after the most persistent efforts of Mr. Hunter and others to postpone it, by which the bill passed, February 7, 1859, 25 ayes to 22 noes, several members known to be in favor of the bill being temporarily absent and among them Pearce and Collamer.

Two unimportant amendments had been attached by the Senate, and when the bill came back to the House these, upon my motion, and after a vote to lay the bill upon the table had been defeated by a vote of 148 to 95, were at once concurred in without a division, February 16, 1859.

This measure, upon which I had set my heart so long, now only lacked the signature of the President to become a law. For a week the bill was neither signed nor returned by President Buchanan. A veto began to be apprehended. In my speech I had cited the vote of Mr. Buchanan when a Senator in favor of a grant of public land to aid an institution for the deaf and dumb in Kentucky. Toombs of Georgia, though he had voted against the bill, did not hesitate to say that 'the bill was not such a one as the President would be justified in vetoing by a d---n sight.' On the morning of the 24th of February Daniel E. Sickles, a member from the city of New York, came to me for a copy of my speech, which he wanted to take to the President, to show him his previous record and to urge him not to veto the bill. Sickles was really a man of ability, a ready speaker, and with many generous traits of character, but his support of the bill - and he had voted for it - was wholly unexpected by me and dictated more perhaps by political policy than by profound interest in the measure itself. He had been the Secretary of Mr. Buchanan while he was our Minister at London, and had the reputation of having been personally useful to 'Old Buck', who lived and died a bachelor, and was still credited with being one of his most potential advisers. At this moment I certainly hoped his influence in that quarter was not on the wane, or that he had not been supplanted by any party hostile to the College Land Bill.

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Of course I gave to Mr. Sickles the speech and he jumped into the saddle and made all haste to the White House. As soon as he returned, he told me he feared he had been too late and that some Democratic Senators had been before him, one of whom possibly might have been Mr. Slidell of Louisiana, who was a skillful manipulator of men and measures and a midnight plotter among the discontented elements of the South.

Before the day closed, the veto of the President was a fixed fact. After being received and read, it was followed by me in some brief comments, not in the best humor, but of course the bill could not be carried by a two-thirds majority over the President's veto, though the 105 stood firmly for the bill, while the negative fell off to 96. The bill was dead, but there yet remained some hope of a resurrection. Nothing more could be done except to wait for a possible change of the administration and certain change of the President.

Thirteen States had instructed their members to support this bill, and petitions from national and state agricultural societies and from large numbers of the people had shown the wide interest the measure had excited. All over the country many gentlemen interested in the subject of education favored me with their correspondence. The name of one, a foremost and influential friend, Colonel Marshall P. Wilder, must at least be recorded. His sympathy and support were unflagging.

The contest of 1860 came on and Mr. Lincoln was victoriously elected, but then arose the absorbing question as to the life of the Republic. How to save that was the all-engrossing topic before which all else must give way. Armies, leaders, taxes, money in the empty treasury must be had and had right away.

December 16, 1861, amid the throng of subjects then pressing upon the attention of our legislators, I once more ventured to introduce the College Land Bill, which was referred to the Committee on Public Lands, of which John Fox Potter was of Wisconsin was Chairman, and after long delay he reported the bill, May 29, 1862, with the recommendation 'that it do not pass'. An adverse report by a committee often gives what is called a black-eye to a bill from which it is hard to recover. Mr. Potter's action grieved me much.

Being busy day and night - and it was said there are no Sundays in revolutionary times - in preparing a far more comprehensive Internal Revenue Tax Bill than our national exigencies had ever before required, I had some fear that ere that could be accomplished, the session would be so far advanced that the College Land Bill would fail for want of time. To hedge against this, I handed a copy of the bill to my friend Old Ben Wade of Ohio, with the request that he should introduce it in the Senate, to which that sturdy Senator readily assented and there presented the bill on May 2, 1862.

Congress had given to the States millions (of acres) of swamp lands - very swampy while owned by the United States, but not enough swamp to hurt afterwards; - had by the Graduation Act reduced the price of all unsold lands long exposed for sale to a mere pittance; had granted immense subsidies of lands to many States to build railroads - notably to Wisconsin - Potter's and Wilkinson's State; had given 1,280 acres, one eighteenth part of all the public lands, to each town in the several new States, for the endowment of common schools, and had finally passed the Homestead Act. This would seem to have been rather a liberal policy toward our younger sister States, but this was not all.

It was foreseen that the land was to be given away, and beyond that that the older States would be depleted to some extent to furnish the settlers and their pockets depleted to furnish capital to complete railroads much in advance of business. Yet Mr. Potter and a few more seem to have regarded all this as a policy of selfishness for the sheer benefit of the older States. To listen to the debates of some of these heated champions of the new States, like Jim Lane of Kansas, most distinguished for killing what was called 'border ruffians' - unless the killing of himself while his character was under a cloud should be excepted - it would have been supposed that the Nation had no rights in the public lands and that it was rank usurpation to claim any ownership. But their arguments were so obviously one-sided that they could not prevail, and many of the Western men were more just, being quite ready to admit that the College Land Bill would greatly more benefit them than the people of the North and East.

May 12, 1862, Senator Wade called up the bill, and after some action thereon, Senator Lane wanted to postpone it until he could examine it, and it was postponed accordingly. The Senate always pays great deference to the personal requests of its members.

The bill was again called up by the indefatigable Wade, May 22, 1862, but the morning hour was consumed with no result save the violent speeches of Lane and Wilkinson. On the 24th the morning hour was again lost in fruitless discussion, and once more on the 27th; Wilkinson on the 28th consumed all the time in a bitter onset against the bill; and on the 29th the tex bill had reached the Senate, a measure which could not be second to any other, when the College Land Bill had to give way.

At last, June 10th, the time had arrived for the final action of the Senate and the bill passed by the very large majority of 32 to 7. Senator Grimes, although instructed by his State to support the bill, voted against it because Senator Wade had allowed an amendment to be adopted limiting the amount of lands which might be located in any one State to one million acres, and this he thought would operate to the disadvantage of the Territories.

Before the bill got through the Senate, I asked leave of the House to have printed a substitute which I proposed to offer to the bill pending in the House, embracing about the amendments made in the Senate, but Holman of Indiana objected. On the 6th I succeeded in obtaining the floor to make my second set speech in favor of the measure. Originally the amount asked for in the vetoed bill was for each State, according to the number of representatives, including Senators, 20,000 acres for each, but now 30,000 acres was asked for.

Of course the bill now came to the House and there, June 17, 1862, I moved to lay on the table all bills until the College Land Bill was reached. This motion was successful against the very persistent opposition of Mr. Potter of Wisconsin, who made all the dilatory motions; for a call of the House, to adjourn, to postpone, to lay on the table, and to refer to the Committee of the Whole on the State of the Union; but the measure lost nothing by this kind of warfare, all the motions being defeated, and it passed the House by the very large majority of 90 to 25. The representatives of the States in rebellion were present. Colfax, Julian, Lovejoy, Potter, Windom, and F. A. Conkling, among Republicans, I regretted to see, voted against the bill; yet rarely has any bill of equal importance received a more generous support, and to many Democrats inside of Congress, and more outside, I was much indebted for kindly sympathy and cooperation.

There was now no apprehension of a Presidential veto, and in due time the bill received the formal approval of President Lincoln. (494)

The First College Land-Grant Bill.

The first land-grant bill, introduced in the House of Representatives by Mr. Morrill, December 14, 1857, reads as follows:

H. R. 2

A Bill donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there be granted to the several States and Territories, for the purpose hereinafter mentioned, six millions three hundred and forty thousand (6,340,000) acres of land, to be apportioned to each State a quantity equal to twenty thousand acres for each senator and representative in Congress to which the States are now respectively entitled, and to each Territory sixty thousand acres.

Sec. 2. And be it further enacted, that the land aforesaid, after being surveyed, shall be apportioned to the several States and Territories in sections or subdivisions of sections, not less than one quarter of a section: and whenever there are public lands in a State or Territory worth one dollar and twenty-five cents per acre, (the value of said lands to be determined by the Governor of said State or Territory,) the quantity to which the State or Territory shall be entitled shall be selected from such lands, and the Secretary of the Interior is hereby directed to issue to those States in which there are no public lands of the value of one dollar and twenty-five cents per acre, land scrip to the amount of their distributive shares in acres under the provisions of this act, said scrip to be sold by said States and the proceeds thereof applied to the uses and purposes prescribed in this act, and for no other uses or purposes whatsoever: provided, that in no case shall any State or Territory to which land scrip may thus be issued be allowed to locate the same within the limits of any other State, or of any organized Territory of the United States, but their assignees may thus locate said land scrip upon any of the unappropriated lands of the United States subject to private entry.

Sec. 3. And be it further enacted, that all the expenses of management and superintendence of said lands, previous to their sales, and all expenses incurred in the management and disbursement of the moneys which may be received therefrom, shall be paid by the States to which they may belong out of the Treasury of said States, so that the entire proceeds of the sale of said lands shall be applied without any diminution whatever to the purposes hereinafter mentioned.

Sec. 4. And be it further enacted, that all the moneys derived from the sale of the lands aforesaid by the States or Territories to which the lands were apportioned, and from the sale of land scrip hereinbefore provided for, shall be invested in stocks of the United States, or of the States, or some other safe stocks, yielding not less than five per centum upon the par value of said stocks; and that the moneys so invested shall constitute a perpetual fund, the capital of which shall remain forever undiminished (except so far as may be provided in section fifth of this act), and the interest of which shall be inviolably appropriated, by each State or Territory which may take and claim the benefits of this act, to the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific or classical studies, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States and Territories may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.

Sec. 5. And be it further enacted, that the grant of land and land scrip hereby authorized shall be made on the following conditions, to which, as well as to the provisions hereinbefore contained, the previous assent of the several States and Territories shall be signified by legislative acts:

- First: If any portion of the fund invested, as provided by the foregoing section, or any portion of the interest thereon, shall, by any action or contingency, be diminished or lost, it shall be replaced by the State or Territory to which it belongs, so that the capital of the fund shall remain forever undiminished; and the annual interest shall be regularly applied without diminution to the purposes mentioned in the fourth section of this act, except that a sum, not exceeding ten per centum upon the amount received by any State or Territory under the provisions of this act, may be expended for the purchase of lands for sites or experimental farms, whenever authorized by the respective legislatures of said States or Territories.
- Second. No portion of said fund, nor the interest thereon, shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation, or repair of any building or buildings.
- Third. Any State or Territory which may take and claim the benefit of the provisions of this act, shall provide, within five years, at least not less than one college, as described in the fourth section of this act, or the grant to such State or Territory shall cease: and said State or Territory shall be bound to pay the United States the amount received of any lands previously sold, and that the title to purchasers under the State or Territory shall be valid.
- Fourth. An annual report shall be made regarding the progress of each college, recording any improvements and experiments made, with their cost and results, and such other matters as may be supposed useful - one copy of which shall be transmitted by mail free, by each, to all the other colleges which may be endowed under the provisions of this act, and to the Smithsonian Institution, and the agricultural department of the Patent Office, at Washington.

~~Under the rules of the House this bill would go to the Committee on Public Lands but Mr. Morrill made an unsuccessful effort to have it referred to the Committee on Agriculture, of which he was a member.~~

According to the rules of the House, the appropriate committee to which this bill should be sent was the Committee on Public Lands, but Mr. Morrill moved that it be referred to the Committee on Agriculture of which he was a member. Mr. Morrill's original motion regarding the bill was as follows:

"I ask leave to introduce a bill donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts, of which previous notice has been given; and shall ask that it be referred to the Committee on Agriculture, and ordered to be printed."

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Mr. Cobb, of Alabama, objected to printing the bill as being unusual "on its introduction and reference", and Mr. Morrill withdrew that part of his motion.

Mr. Letcher of Virginia objected to the reference of the bill to the Committee on Agriculture because "the probability is, that if this bill goes to the Committee on Agriculture, it will be reported back with leave to have it referred to the Committee on Public Lands."

In defense of his motion, Mr. Morrill said:

"It will be seen, by reference to the rules, that the duties of the Committee on Agriculture are not defined. It is therefore left to the discretion of the House as to which of the committees this bill should be referred; and if a subject like this, relating as it does particularly to agriculture, is not a fit subject for that committee to consider, I am very much at a loss to know what subject would be fit. It will be seen by the provisions of the bill that it is for the purpose of granting lands for the benefit of agriculture and the mechanic arts, where a liberal education for those engaged in the industrial pursuits and provisions of life may be obtained.

Well, now I have no jealousy of the Committee on Public Lands; but it seems to me that that committee has been, and will be, burdened with a sufficient amount of business, and its duties are thus defined in the rules of the House:

'It shall be the duty of the Committee on Public Lands to take into consideration all such petitions and matters or things respecting the lands of the United States as shall be presented, or shall or may come in question, and be referred to them by the House; and to report their opinion thereon, together with such propositions for relief therein as to them shall seem expedient.'

The bill is not to take charge of the public lands. It is not to reduce their price. It is not for the purpose of surveying them in any manner. It is not to grant preemptions. It only appropriates a small pittance of the millions of our public lands: and the only reason that I can conceive why it should be proper to refer this bill to the Committee on Public Lands is to ascertain whether or not we have the lands on hand. But in regard to that, we have the assurance of the President that we have millions of acres.

I do not think, Mr. Speaker, that it would be any more appropriate to send to the Committee on Public Lands an invalid pension petition for bounty lands, than it would be to send this bill to it. I appeal to the common fairness of the House, to allow this subject to go to a committee where it shall not be strangled, to a committee that will be likely to mature and perfect the bill, a committee of its friends. Then, if it should not find favor with the House, it will, of course, be voted down.

We have such a committee, and that committee has, I am told, a very beautiful room. I hope that the House will allow that committee and that room to be devoted to some useful purpose."

After some further debate by Mr. Letcher, the question being on the motion of that gentleman to refer to the Committee on Public Lands, the yeas and nays were demanded and ordered. The question was then taken and it was decided in the affirmative - yeas 105, nays 89 - and the bill was sent to the Committee on Public Lands.

The bill was received by the Committee on Public Lands December 15 and was printed on December 16. It remained in the custody of the Committee four months and was then adversely reported April 15, 1858, by Mr. Cobb, of Alabama, the chairman. Mr. Walbridge of Michigan presented a minority report of those in favor of the bill. At the same time Mr. Walbridge moved that the reports of the Committee be printed "so that every gentleman may act advisedly on the subject." Before a vote could be taken, the "morning hour" of the House had expired and Mr. Walbridge could not secure permission to print the reports until the following day, April 16, 1858.

Mr. Walbridge's motion was as follows:

"It will be recollected by the House that a bill was reported yesterday from the Committee on Public Roads, donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts, accompanied by a majority and the minority report. A motion is pending to print these reports and to postpone the consideration of the subject. I ask the unanimous consent of the House that pending the motion to postpone, the reports may be printed."

There being no objection, it was so ordered.

On April 20, the "morning hour" came up again in the routine of the House, and a pending motion to postpone consideration of the bill permitted Mr. Morrill to deliver a speech submitting a substitute bill to be recommitted to the Committee on Public Lands. After obtaining the withdrawal of motions to postpone and to recommit the original bill, Mr. Morrill spoke in part as follows:

"I now offer the amendment which I sent to the Chair, to come in after the enacting clause, in the nature of a substitute for the whole bill. Mr. Speaker, I know very well that when there is a lack of arguments to be brought against the merits of a measure, the Constitution is fled to as an inexhaustible arsenal of supply. From thence all sorts of missiles may be hurled, and though they 'bear wide' of the mark, they do not 'kick the owner over'. I have also noticed that lions accustomed to roar around the Constitution are quite disposed to slumber whenever it is desirable for certain gentlemen, who carry extra baggage, to leap over the impediment. But, while I do not propose to consider the Constitutional argument at any great length, I shall not wholly blink it out of sight; and all the favor asked is, that the Constitution may not be strained and perverted to defeat a measure no less of public good than of public justice - just politically, just to all the States, and just, above all, to the manhood of our country.

We exert our power and expend millions to protect and promote Commerce through lighthouses, coast surveys, improvement of harbors, and through our Navy and Naval Academy. Our military 'crown-jewels' are manufactured at West Point on Government account. We make immense grants of land to railroads to open new fields of internal trade. We secure to literary labor the protection of the copyright. We encourage the growth and discipline of hardy seamen by eking out their scanty rewards through Governmental bounties. We secure to ingenious mechanics high profits by our system of patent rights. We make munificent grants to secure general education in all the new States. But all direct encouragement to agriculture has been rigidly withheld.

When commerce comes to our doors, gay in its attire and lavish in its promises, we 'hand and deliver' at once our gold. When Manufactures appear, with a needy and downcast look, we tender, at worst, a 'compromise'. And then the fiery little god of war bristles up and makes havoc of all we have left. So that when Agriculture appears

'A creature not too wide or good
For human nature's daily food'-

though taxed to support all her sisters and idle brothers, and to espouse their quarrels - we coldly plead there is nothing left for her, and even spurn the admission of her affinity to the family by omitting all mention of her in the records of our statutes. Ceres does not appear among the gods of Olympus - only appears in a picture on one of our Treasury notes!

It is our province, as a nation and as individuals, to do well whatever we undertake. The genius and skill of our artists and artisans have been universally recommended. Our naval architecture is a subject of national pride. Our engineers are doomed to no merely local fame. Our agricultural implements are beyond the reach of competition. Yet, while we may be in advance of the civilized world in many of the useful arts, it is a humiliating fact that we are far in the rear of the best husbandry in Europe; and, notwithstanding here and there an elevated spot, our tendency is still downward. Does not our general system of agriculture overshadow ultimate decay? If so, is it beyond our Constitutional power and duty to provide an incidental remedy?

The prosperity and happiness of a large and populous nation depend:

1. Upon the division of the land into small parcels.
2. Upon the education of the proprietors of the soil.

Our agriculturists, as a whole, instead of seeking a higher cultivation, are extending their boundaries and their education, on the contrary, is limited to the metes and bounds of their forefathers.

If it be true that the common mode of cultivating the soil in all parts of our country is so defective as to make the soil poorer year by year, it is a most deplorable fact, and a fact of national concern. If we are steadily impairing the natural productiveness of the soil, it is a national waste, compensated only by private robbery.

The leading fact, however, of a wide-spread deterioration of the soil, stands out too boldly to be denied. The great, reversible law of American agriculture appears in the constant and increasing diminution of agricultural products, without any advance in price. It follows, just in proportion, that the capital is disappearing and that labor receives a diminishing reward. Our country is growing debilitated, and we propagate the consumptive disease with all the energy of private enterprise and public patronage.

There is little doubt but the three quarters of the arable land of our whole country is more or less subjected to this process of exhaustion. It has been estimated by Dr. Lee, of Georgia, that the annual income of the soil of not less than 100,000,000 of acres of land in the United States is diminishing at the rate of ten cents per acre. This would amount to \$10,000,000, and involve the loss of a capital of \$166,666,666 annually. A sum greater than all our national and state taxation!

Men waste hundreds of acres of land on the theory that it is inexhaustible, whose own wealth might not purchase the raw materials - the magnesia, lime, soda, potash, phosphorus, sulphur, carbon, nitrogen, &c - necessary to make a single acre possessing primitive fertility. Thus the accumulated store of ages passes away in a single generation.

And this waste of the soil is not the only thing wasted. For want of knowledge and skill which the institutions aimed at can alone impart, Colonel Wilder, a gentleman of well-earned fame, estimates the annual loss of the single State of Massachusetts, in the one product of her cereal grains, at \$2,000,000. Another gentleman, in the same State, of great experience in the line of stock, dairy, etc. reports the loss from the same ignorance and unskillfulness in these interests, at \$15,000,000 for that State alone. The loss of New York upon her 447,014 horses, (and Ohio, by the census of 1850, had more), through the universal incompetence in the veterinary art, has been reckoned at not less than \$2,000,000. The horse, that 'wonder of nature', so universally adored by man, for the slightest ailment, is handed over to the butchers of quackery, whose practice is more fatal than that ascribed even to Dr. Hornbrook:

'Folk maun de something for their bread,
And sae maun Death.'

We are indebted to Europe for our civilized inhabitants, and for nearly all of our domestic animals, whatever the testimony of the rocks may be as to preexistence of the latter. The soil we have acquired by the displacement of the red man. The only thing we constantly dwell upon with complacency is, that we surpass the stock from which we sprang, and that we present our land better than we found it. But this is not beautiful unless true!

We bring forth new States by the litter, and when we want more, like our Norman ancestors, we commit 'grand larceny', and annex them. This progress seems wonderful, but with it appears the bitter fact that these new States in half a century - a brief time in the history of States - become depleted and stationary. This early maturity is followed by sudden barrenness.

Concerted effort is necessary to educate and elevate whole nations. That effort is being made abroad with governmental aid in the lead. Here, in the 'model Republic', where a free Republican government is installed to guard the general welfare, no such effort is being made. Government has not yet followed the lead of the people, even afar off. We do not ask for constant and persistent outlay and guidance; but a recognizance for once, and in the most convenient mode, of the propriety of encouraging useful knowledge among farmers and mechanics, in order to enlarge our productive power, give intelligence to those who will esteem it a higher boon than land or titles, and relieve ourselves from the thralldom of a debt due to holders abroad, for the little agricultural science we now have, and which is quite unsafe to use, by reason of the great differences of soil and climate. Many foreign states support a population vastly larger per square mile than we maintain, and hold their annual increase; but, by the system of husbandry generally pursued here, the land is held until it is robbed of its virtue, skimmed of its cream, and then the owner, selling his wasted field to some skinflint neighbor, flies to fresh fields with the foul purpose to repeat the same spoilation; and this annual exodus which prevails over all the older States, and even begins upon the first settlements of the new States before their remoter borders have lost sight of the savage, painfully indicates that we have reached the maximum of population our land will support in the present state of our agricultural economy. Our skill must be further developed, or here is our limit. A fever-and-anguish progress, warmed by speculative excitements, and chilled by banks, may be kept up while our unpeopled public domain is supposed to be inexhaustible, and while those who buy, buy to sell, and never otherwise intend 'to hold or drive'. But there is a barrier already visible, more impassable than the Rocky Mountains, the great sand plains stretching north and south, commencing near the 98th degree of west longitude, or about the center of Kansas, and running to the Rocky Mountains, so barren of soil, water, timber, and all vegetation, as to preclude the possibility of settlement by civilized inhabitants. Here the wave must be stayed; but shall we not prove unworthy of our patrimony if we run over the whole before we learn how to manage a part?

We are deluded with the notion that, as a nation, we may now claim rank with the oldest, the best, and the strongest. Our population is rapidly increasing, and brings annually increased demands for bread and clothing. If we can barely meet this demand while we have fresh soils to appropriate, we shall early reach the point of our decline and fall. The nation which tills the soil so as to leave it worse than they found it, is doomed to decay and degradation. Other nations lead us, not in the invention and handling of improved implements, but in nearly all the practical sciences which can be brought to aid the management and results of agricultural labor. We owe it to ourselves not to become a weak competitor in the most important field where we are to meet the world as rivals. It touches us in tenderest points, our national honor as well as our private pockets. While we ought to possess the granary of the world, it has been but a brief time since bread-stuffs rose almost to starvation point, and indicated the possibility that we might not forever escape the only test, that of famine, to which our institutions have not been subjected. Able to be independent, in a broader sense than any other people, having an area 95 times as large as England and 17 times as large as Belgium, yet over 100,000,000 of our imports of the last fiscal year were products mainly of the soil.

It was not until Rome, deluded with military conquests and luxurious living, had become largely indebted to her conquered provinces for her agricultural products, that the 'populous north' brought forth that rude horde which obtained the mastery and accomplished the downfall of the Roman Empire.

Agriculture undoubtedly demands our first care; because its products, in the aggregate, are not only of greater value than those of any other branch of industry, but greater than all others together; and because it is not merely conducive to the health of society, the health of trade and of commerce, but essential to their very existence. But, while it is the most useful and earliest of the arts, so sluggish have been its advances that we are yet experimenting upon problems which were moot-points with farmers two thousand years ago. Surely an interest so superior, and of such vital consequences, ought not to be left to lingering routine, but the aid of science should be invoked to exhilarate its pace, until it can keep step with that of other industrial pursuits of mankind.

The agriculturists have been, within a few years, aroused to their own wants. Periodicals, from a higher point of dignity and influence, have fired their zeal. The eager crowds which throng to the annual fairs of our agricultural societies, from the National down to 'all the stars of lesser magnitude', proclaim the universal hunger there is for a profounder information touching that which comes home to their business and bosoms. They know there are mysteries dearly concerning them, and they demand of learning and of science a solution.

'Deformed, unfinished' experiments -

- 'scarce half made up,
and that so lamely' -

will not do. Farmers will not be cheated longer by unsustained speculations. The test of the field must follow and verify that of the laboratory. The half-bushel and the balance must prove the arithmetic. The result must support the theory. They want substance and not shadow - bread and not a stone. They know well there is a vast force of agricultural labor hitherto misapplied, muscles that sow where they do not reap, and they demand light - demand to have their arms unopinioned! What has been an art merely to supply physical wants must become a science - though it wears

'hadden gray and a' that' -

doing the same service, but more abundantly, and also doing something to satisfy and elevate the manhood of the mass of the people. Let us have such colleges as may rightfully claim the authority of teachers to announce facts and fix laws, and to scatter broadcast that knowledge which will prove useful in building up a great nation - great in its resources of wealth and power, but greatest of all in the aggregate of its intelligence and virtue.

The mineral wealth of our country, already disclosed, assumed almost unbounded proportions; but destitute of experience as we are, and largely dependent upon the skill of those but half-taught from other lands, our mines are much less remunerative than they would be under the control of Americans, with some fundamental instruction in their vocation.

There is no class of our community of whom we may be so justly proud as our mechanics. Their genius is patent to all the world. For labor-saving contrivances, their tact seems universal; and when any of them is detailed to do the breathing of an engine, he speedily furnishes lungs for the engine to do that sort of work for itself. But they snatch their education, such as it is, from the crevices between labor and sleep. They grope in twilight. Our country relies upon them as its right arm to do the handiwork of the nation. Let us, then, furnish the means for that arm to acquire culture, skill, and efficiency.

We have schools to teach the art of man slaying and to make masters of 'deep-throated engines' of war; and shall we not have schools to teach men the way to feed, clothe, and enlighten the great brotherhood of man? It is just on the part of statesmen and legislators, just on the part of other learned professions, that they should aid to elevate the class upon whom they lean for

support, and upon whom they depend for their audience. There is no clash of interests. It is not designed to make every man his own doctor, or every man his own lawyer; but to make every man understand his own business. A lawyer is not the worse for having an intelligent client. nor a clergyman the worse for having a prosperous parishoner. Our present literary colleges need have no more jealousy of agricultural colleges than a porcelain manufactory would have of an iron foundry. They move in separate spheres, without competition, and using no raw material that will diminish the supply of one or the other.

The farmer and the mechanic require special schools and appropriate literature quite as much as any one of the so-called learned professions. The practical sciences are nowhere else called into such repeated and constant requisition. Would it be sound policy for one who expected to expound Blackstone to limit his reading to a muck manual or to agricultural chemistry? If it would not, how are we to expect one to solve all the scientific relations of earth, water, air, and vegetable and animal life, who has only explored reading, writing and arithmetic. reckon

All other professions and pursuits among their brightest jewels men who were recruited from the robust ranks of agriculture. It is the untainted blood from this source that supplies the waste in the pulpit, the bar, the forum, and the camp. No other pursuit in life obtains this universal tribute, that, whatever may be the present idol of devotion, all classes and ranks of men hope to reach that estate first bestowed upon Adam, and become proprietors of the soil as their ultimate earthly paradise. Washington, Calhoun, Clay, and Webster, are more secure of love and homage as farmers than even as men of highest public renown; and Mount Vernon, Fort Hill, Ashland, and Marshfield, the Meccas of America, prove the ideal truth of the words of Pliny, that 'the earth took delight in being tilled by the hands of men crowned with laurels and decorated with triumphant honors.'

Many of the purest embellishers of literature have been drawn from the field of the husbandman. Gems, not only of poesy and song, but of painting and sculpture, of philosophy and eloquence, thus have their origin. Let Agriculture, then, make its reprisals, and build up a literature at once intelligent and satisfactory for its millions of thinkers.

We need a careful, exact, and systematized registration of experiments - such as can be made at thoroughly scientific institutions, and such as will not be made elsewhere. These tests and these tables, so furnished, will give us, when reported and collected, as is provided for in this bill, a rational induction of principles upon which we may expect to establish a proper science; and the more widely gathered are the facts, the sounder the science. The discoveries of Columbus-struck amateurs will not be trumpeted forth until they have received the sanction of a body less sanguine than the vendors of a patent. Spurious documents will be touched lightly with the spear of Ithuriel, and no longer squat around the ears of weary ~~of~~ weary ploughmen.

We need to test the natural capability of soils and the power of different fertilizers; the relative value of different grasses for flesh, fat, and milk-giving purposes; the comparative value of grain, roots, and hay for wintering stock; the value of a bushel of corn, oats, peas, carrots, potatoes, or turnips, in pounds of beef, pork, or mutton; deep plowing as well as drainage; the vitality and deterioration of seeds; breeds of animals; remedies for the potato disease and for all types of insects destructive to cotton, wheat, and fruit crops. These, and many more, are questions of scientific interest even beyond their economical importance in the researches of the agriculturists.

The philosophy of manures or of giving plants their appropriate food, is in its infancy. In England, they have, through the process of feeding wheat, raised the average yield to double its former amount. Liebig, employed in 1840 by the Royal Agricultural Society, was almost the first, after Sir Humphrey Davy, to practically apply agricultural chemistry so as to arrest the attention of farmers. It was at his suggestion, only seventeen years ago, that guano was brought into notice. In 1851, notwithstanding its extravagant price, England imported 243,014 tons of this concentrated fertilizer, proving that the fabled eggs of the golden goose have been eclipsed in value by the 'evacuations of sea-gulls.'

It is plainly an indication that education is taking a step in advance when public sentiment begins to demand that the faculties of young men shall be trained with some reference to the vocation to which they are to be devoted through life. It is clear that intellectual discipline can be obtained under more than one mode, and, if the primary education sought for this purpose can be afterwards applied to practical use in the destined occupation, it is a point clearly gained. Law, theology, and medicine, have been specialties from the time whereof the memory of man runneth not to the contrary. Special schools for art, trade, and commerce, though of later growth, have been long established in many places throughout Europe, and in our American cities. In some places these institutions, intended to be practical rather than speculative, go by the not inapt name of real schools. Agricultural colleges and schools in many portions of Europe are a marked feature of the age. In our own country the general want of such places of instruction has been so manifest that states, societies, and individuals, have attempted to supply it, though necessarily in stinted measure. The 'plentiful lack' of funds has retarded their maturity and usefulness; but there are some examples, like that of Michigan, liberally supported by the State, in the full tide of successful experiment. Adequate means to start on a scale commensurate with the great objects in view seems an indispensable prerequisite. States have been unable to impose at once the increased taxation that would be required, and the liberality of private individuals has been unequal to the task. But if this bill shall pass, the institutions of the character required by the people, and by our native land, would spring into life, and not languish from poverty, doubt, or neglect. They would prove (if they should not literally, like the schools of ancient Sparta, hold the children of the State) the perennial nurseries of patriotism, thrift and liberal information - places 'where men do not decay'. They would turn out men for solid use, and not drones. It may be assumed that tuition would be free, and that the exercises of holding the plow and swinging the scythe - every whit as noble, artistic, and graceful, as the postures of the gymnastics or military drill - would go far towards defraying all other expenses of the students. Muscles hardened by such training would not become soft in summer or torpid in winter; and the graduates would know how to sustain American institutions with American vigor.

It is desirable that the agricultural hive, in all its industrial ramifications, should furnish such generous rewards, such noble incentives, as to reclaim the truants who have fled to and clog and embarrass other pursuits and professions with untrained adventures. The New York Mercantile Agency states the number of stores in the United States at 204,061, which would be about one store to every 123 inhabitants. This shows

'Trade wields the sword; and agriculture leaves
Her half-turned furrows; other harvests fire
An avarice of renown.'

I suppose that it might be a fair estimate to say that eighty out of every hundred of these traders become insolvent every ten years. But had they invested their capital and labor in agriculture, it may be safely assumed that not twenty out of every hundred would have failed to secure a competency.

Adams Smith, after having noticed 'the precarious and uncertain possession' of capital engaged in commerce and manufactures, says:

'That which arises from the more solid improvements of agriculture is much more durable, and cannot be destroyed but by those more violent convulsions occasioned by the depredations of hostile and barbarous nations continued for a century or two together.'

Mr. Speaker, when a money pressure overtakes the country, like that through which we are just passing, in searching for its cause no one thinks of charging it upon agriculturists. They are not only industrious, but frugal. Thrift is their cardinal virtue. They do not produce, vend, nor consume luxuries. They hasten slowly, and go untouched of all epidemic speculations. But when the crisis comes - when Commerce, Manufactures, banks, and even government itself, quail beneath the storm - all eyes turn to the hardy tillers of the soil for relief. They stand, as they ~~have~~ always stand, with enough for themselves and something to spare. They furnish raw material, freight, means of liquidation or of supply; and yet, when they would be even more useful, shall we pronounce them unworthy, and deny them opportunity?

It is one of the political axioms of the writer already quoted, everywhere credited, that national wealth is greatly increased or diminished by the more or less skill, dexterity, and judgment, with which labor is generally applied. As legislators, we can have no subject before us of higher intrinsic importance.

Manufactures, when their books disclose a losing business, change to a different class of goods; merchants, in like circumstances, to a different trade and other markets; but all history shows the tenacity with which habits acquired in the cultivation of the land cling to a people from generation to generation. In all ages farmers have been stable, conservative, and reverent to antiquity. The same plow as described three thousand years ago at 'Athens, the eye of Greece, mother of arts and eloquence', is still in use among the modern Greeks. The habitant of Canada as much believes today in the propriety of placing the yoke on to the horns of the ox, in order to secure the entire strength of the animal, as he did in the days when he owed allegiance to the Grand Monarch. The old Roman plow, sometimes drawn, in the days of Nero, 'by a wretched ass on the one side, and an old woman on the other', still retains its place in Italy, and in parts of Spain and the south of France. If we turn to the descendants of the Puritans, we shall find some of these yet kill their pork and plant their corn in 'the old of the moon'. In all ages, and in all countries, the habits, as well as virtues of agriculturists, remain fixed.

Agricultural men dwell apart. Their business keeps them at home, and they cannot combine to secure general improvements, or to make their complaints heard. They suffer in silence - the rolling years only noted by 'seed time and harvest.'

All over the highest civilized parts of Europe we find the different Governments alive to the wants of agriculture. They have established ministers of instruction, model farms, experimental farms, botanical gardens, colleges, and a large number of secondary schools, with no other purpose - and they need no higher or nobler - than the improvement of the industrial resources - the farms and the farmers - of the respective countries. All these are chiefly supported by large annual expenditures of the different Governments, except so

far as any may be self-supporting institutions. The effect is in the largest degree favorable to the people and to increased production. But the teachings of European professors are of little consequence to Americans, even if they could be comprehended and instantaneously adopted, as they are rarely suited to our circumstances. Can we not have something that we may claim as our own? Young Americans should have some chance to study agriculture as a profession, and be attracted to it as a learned, liberal, and intellectual pursuit. Is it true, as our detractors assert, that science can flourish only under the patronage of royalty?

This system of education is known to be more complete in Prussia than in any other nation in Europe. It may be said that all the children attend school until they are thirteen years old; and agricultural colleges, and schools for the mechanic arts and higher trades, are liberally sustained, and with a much larger staff of professors than is common in the United States. This nation is making rapid progress in wealth and intelligence.

In Saxony they have a number of experiment stations, or experimental farms, with laboratories attached, and five or more schools exclusively for agriculture. There is no country in the world where agriculture and all branches of industry are pursued with more enterprise and success than in the little monarchy of Saxony; and there, of 315,185 children between the ages of six and fourteen years, 311,454 were, in 1851, in actual attendance at school.

Belgium has its agricultural schools also, and great opportunities for general education are given, especially in the larger towns. Here farming is conducted most on a scientific basis; and Belgium, supporting a population of 336 to the square mile, in a climate inferior to that of Kentucky or Virginia, averaging only 26 and 23 to the square mile, is the first in rank as an agricultural state in Europe. Its once noted battle-fields are now equally noted as model farms. This preeminence is chiefly the result of scientific attention to manures.

France, from the time of Napoleon, has done much for agriculture, beet-sugar, the mulberry, the grape, as well as Merino sheep and the Thibet goat, have received imperial attention. No expense in France is shirked in the cause of agricultural science. Her botanical gardens, chemical laboratories, physiological museums, and schools for instructions in the veterinary art; surpass all others in existence, and with her five agricultural colleges, and almost one hundred inferior agricultural schools are performing herculean labors for the elevation of the farming population of the empire. The Revolution and the successive wars loaded France with an immense debt; but this was rapidly extinguished from the never-failing resources of her soil. The abrogation of the game laws and many other feudal enactments has aided her progress, but the breaking up and division of every estate at the death of the owner, doubtless retards much of permanent improvement. But for this abuse of a true principle, and the illiterate condition of her people, France would have been the pioneer of rural economy.

As it is, we look more to England and Scotland, and to Ireland to some extent, for principles and facts for our instruction. Here we find agriculture developed in all its noblest attitudes. Science, wealth, taste, mind, and rank, combine to increase its profit, beauty, and honor. The large fortunes of individuals enable science to delve constantly in its behalf; but the Government, far from thinking that enough, annually contributes liberally to the same object, especially in Ireland. Colleges and schools of agriculture are numerous in Great Britain, but their usefulness is greatly restricted on account of the limited attendance arising from the jealousies of caste. Agricultural improvement is imposed on such a people from necessity. The heavy taxation, the enormous consumption of luxuries, and density of population, could not be otherwise supported. Science, like the rod of Aaron, has

touched the soil, and behold! the crops are doubled. Nothing but this in Ireland could have checked the dispersion of a nation - a nation, too, that in ten years preceding 1846, exported more grain than all of the United States. Notwithstanding the magnificent proportions of her commerce, flecking all seas with its flag, and notwithstanding her all-embracing manufactures, with their countless fires blazing day and night, England, were her agriculture to retrograde, or the land fail 'to yield her increase', would be numbered with things that were, and the earth no more rock at the sound of Trafalgar or Waterloo.

The Government of Russia, the growing giant of Europe, has recently taken a conspicuous lead in the education of its people, and the cause of agriculture there holds a deserved prominence. Of colleges, schools, and special schools devoted to agriculture, Russia maintains a greater number than any other nation, France only excepted. No nation has risen in the political firmament with a steadier splendor than the great northern bear, which, instead of pawing, like Milton's lion, 'his hinder-part to get free' from the mud of the Nile, is struggling to get free from the Polar ice of ignorance. The back-bone of Russia, in her recent contest, lay in her agricultural forces, and against these but half-tutored resources of men and wealth, half the strength of Europe could only wage a drawn battle. Here we find a despotism, from motives merely of governmental policy, elevating labor, placing it within the power of her agriculturists and artisans to become educated and skillful, while our people with the Government in their own hands, parley on the brink, and do nothing for their own benefit.

Spain is weak in all her industry, because, while an uneducated Spanish gentleman, it is said, cannot be found, so neither can a peasant be found who can read or write.

Italy, anciently far in advance of all her contemporaries, in theory and practice, is now behind all other States in her farming and industrial pursuits, and here we find but one person in fifty provided with any instruction whatever.

I might contrast Bohemia with Saxony, and even Ireland with England, or the different cantons of Switzerland with each other, to show the difference between ignorant and educated culture of the soil, but I have not space.

Thus, we behold the suffrages of all the wiser civilized nations in favor of a measure contemplated by the bill under consideration; examples as much to be imitated as those of an opposite character are to be shunned. If other nations advance, though we but pause, we are distanced. The voice of our country, if it could find utterance, is believed to be over-whelmingly in favor of the establishment of these institutions on our own soil. They are as much needed and will be as gratefully accepted in one direction of our country as another. More than four fifths of our population are engaged in agricultural and mechanical employments. This vast number out of 30,000,000 of people now, to be increased to 50,000,000 in less than twenty years, will forever furnish an inexhaustible supply of pupils who will not forsake their calling. Is it not of grave importance to give this vast force an intelligent direction?

In 1850 there were, between the ages of five and fifteen, 5,106,257 inhabitants of our country. There were engaged in the professions of law, medicine, and theology, 94,575 citizens, and in all the colleges of the United States there were 27,159 pupils only. If these pupils required 239 colleges for their instruction, how many ought we to have for the sons of the millions engaged in agriculture? Why, sir, the number which it may be hoped will be provided for under the auspices of this bill will hardly do more for some years than to supply teachers that will be required in secondary schools.

At the close of the Revolution there was much difficulty about these lands. The States within whose boundaries the ungranted crown lands were situated felt disposed to claim them, unjustly as the other States thought, as state property. But finally all yielded to the Union, using in their conveyance words of like import - that the lands should be considered a common fund for the use and benefit of all. Since then the Revolutionary debt has been extinguished; gratitude for military service has been acknowledged to the extent of 44,109,879 acres; new States have been properly treated with statesmanlike liberality; now by this bill the old States, by whose blood and treasure the public domain was so largely acquired, will be allowed some direct share, but not greater than that of others, in the distribution. What clause in the Constitution interposes any barrier to this?

It cannot be pretended that this is one of a class of cases; for here is one where four-fifths of all the people are directly, and all the rest indirectly, interested. No other can come up representing more than a fractional part of the remaining fifth.

Our Government is also directly interested, as the holder and dealer in large tracts of land. If it be for the interest of small holders of land, it must be for the interest of a large holder. There is not even exclusion of those who do not cultivate their land. If the measure shall in any degree increase the future profits of cultivators, the value of all land, wherever it may be, whether held in small or large quantities, will be augmented. The cotton-gin had hardly done more to raise the price of estates in the South, than would now the discovery of a remedy for the boll-worm, and other destructive insects, which gore and gorge the cotton plant; nor have the reaping machines been of more advantage to western wheat fields, than would be a cure for the wheat midge. These invaders may not be overcome; may not be within the reach of human engineering; one sixth part of the cotton and wheat crop may still be lost; but some resulting improvements may safely be predicated upon the labors of thirty-two or more institutions actively engaged in scientific agriculture. There can be no doubt that the benefits to be derived, will prove an ample consideration for the lands disposed of. One of the most adequate considerations ever received for any estate by parent, is called, in legal parlance, 'love and affection'; and that also will not be wanting here. These considerations are tendered by those older States, to whose toils and expenditures the marketable value of our public domain is so largely indebted. Blot out the canals and railroads of Pennsylvania, New York, and Ohio, costing over \$200,000,000 and the buffalo and the fur-trader on the western prairie might strive for the mastery, but civilization would postpone her triumphs over the savage to a remoter age. Our 'Western Empire' might be taxed the whole cost of the New York and Erie Canal, and then be the gainer; and yet the bill I am advocating will not appropriate, among all the States, one fifth part of its original cost, and not one half of the amount of the yet unpaid debt of New York.

The third clause of Article 4 of the Constitution declares:

'The Congress shall have power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States.'

Here is the whole of it; and there is no restriction save that in the deeds of cession. Our public lands are no longer pledged for a national debt; and, if held for the common benefit of all, how can it be wrong to give all their rightful and exact proportion to the limited extent now proposed? Who will be wronged? What better thing shall we do with them? Whatever discordant opinions there may have recently existed touching the true interpretation of this clause, as to persons, no one will pretend that it does not give complete control over the land (the property) belonging to the United States; and the measure I am considering is a liberal compliance with the powers conferred in that which precedes 'to dispose of and make all needful rules and regulations' respecting so much as is embraced in the bill.

Grants of land during and since 1850 have been made to ten States and Territories, to aid in the construction of more than fifty railroads, of an extent of about nine thousand miles, amounting to 25,403,993 acres. These grants were made on the argument of 'prudent proprietorship', and alternate sections were given away to double the price of the remainder. Whether the policy will result in any loss to the Government or not, these States were treated with a liberality they will never forget. As a prudent proprietor, may we not do that which will not only tend to raise the value of the land, whether owned by individuals or by government, but make agricultural labor more profitable and more desirable as a pursuit in life?

Up to the 30th of June, 1857, we had ungrudgingly donated to different States and Territories 78,736,572 acres of land for schools and universities. No one shall be twitted for such acts by me, ^{but} if the purpose be a noble one as applied to a territory sparsely populated, it is certainly not less so to States thickly peopled. If such donations are Constitutional to inchoate States, can they be unconstitutional when proposed to the Old Dominion, the Empire, Keystone, and Little Rhody? Is there more urgent demand for such aid in behalf of the people of a territory free of debt, whose frame of Government is supported by the nation, than in behalf of States bearing all the debt and burdens of the National Government, and bending under \$245,211,259 of present state indebtedness? Surely the endowment of agricultural colleges ought not to depend upon the resources of States already so oppressively laden, nor upon the come-by-chance charities of individuals, but upon the liberal administration of the Government which has been expressly constituted the trustee of an ample store for the common benefit of all the States.

The executive and legislative precedents which can be arrayed to sustain the principles embodied in this measure are of great weight and authority. Commencing with those coeval with the Constitution, and continuing to a recent date, we have the opinions and acts of men that few at the present day would not think it robbery to claim for any favorite an equality.

Washington brought the subject of agriculture before Congress in his first message. He thought it a subject within the Constitutional jurisdiction, and his experience increased that conviction; for in his last message, Dec. 7, 1796, he refers to it with elaborate argument. He says:

'It will not be doubted that, with reference either to individual or national welfare, agriculture is of primary importance. In proportion as nations advance in population and other circumstances of maturity, this task becomes more apparent, and renders the cultivation of the soil more and more an object of public patronage. Institutions for promoting it grow up, supported by the public purse; and to what object can it be dedicated with greater propriety?'

Thus we have the very germ of the whole project. 'The cultivation of the soil', institutions 'supported by the public purse'. He exclaims, 'To what object can it be dedicated with greater propriety?' It cannot be doubted that donations of land for agricultural colleges would have received the approval of Washington. He proceeds:

'I have heretofore proposed to the consideration of Congress the expediency of establishing a national university, and also a military academy. The desirableness of both these institutions has so constantly increased with every new view I have taken of the subject, that I cannot omit the opportunity of, once for all, recalling your attention to them.

The Assembly to which I address myself is too enlightened not to be fully sensible how much a flourishing state of arts and science contributes to national prosperity and reputation. True it is, that our country, much to its honor, contains many seminaries of learning, highly respectable and useful; but the funds upon which they rest are too narrow to command the ablest professors in the different departments of liberal knowledge for the institution contemplated, though they would be excellent auxiliaries.'

This will be enough to satisfy all as to the opinion of Washington. Let us now see what were the opinions of Jefferson. In his sixth message he thus speaks:

'Education is here placed among the articles of public care; not that it would be proposed to take its ordinary branches out of the hands of private enterprise, which manages so much better all the concerns to which it is equal; but a public institution can alone supply those sciences which, though rarely called for, yet are necessary to complete the circle, all the parts of which contribute to the improvement of the country, some of them to its preservation.'

The message goes on to show that if public moneys were to be used for roads and canals, an amendment of the Constitution would be necessary, but that land might be used for that purpose without an amendment. He then proceeds to urge his favorite university thus:

'The present consideration of a national establishment for education, particularly, is rendered proper by this circumstance also, that if Congress, approving the proposition, shall yet think it more eligible to found it on a donation of lands, they have it now in their power to endow it with those which will be amongst the earliest to produce the necessary income. This foundation would have the advantage of being independent in war, which may suspend their improvements, by requiring for its own purposes the resources destined for them.'

I submit that here the whole question of Constitutional power is covered, as well as a powerful argument suggested, by Jefferson.

For want of time, all reference to Madison, Monroe, and Adams, must be omitted. Jackson was the steadfast friend of agriculture, and the first, in 1837, to call into the Patent Office a practical farmer (Mr. Ellsworth) to collect statistics. As Senator, General Jackson voted a township of land to La Fayette. He approved, June 30, 1834, of giving 36 sections of land to the Polish exiles expelled from Europe by Austria. He approved April 2, 1830, of a bill giving land to a State for the construction of the Miami Canal. Jan. 13, 1831, he approved of a bill granting a single section for schools, in Lawrence, Mississippi.

March 2, 1833, an act was passed changing the Illinois canal grant to a railroad grant, with obligations attached. This was approved by General Jackson. That part of the Cumberland road in Ohio was surrendered in 1831, and that in Virginia in 1833, to the respective States, with a compact that they should keep the same in repair and collect the tolls - approved by General Jackson, and the act decided since to be Constitutional by the Supreme Court of the United States. General Jackson rejected the Land Bill in 1833, mainly for the reason that it first gave to the States wherever the lands might lie, twelve and one half per cent., before there was to be any division among the other States. This he denounced as injustice and inequality. It is enough to say that no such objections can be raised against the division proposed now. There can be no question that General Jackson and the men who cooperated with him would have approved of grants of land to all the States for the benefit of agricultural colleges.

The bill donating lands to the State of Connecticut, for a seminary of learning for the deaf and dumb, passed the Senate in 1819, without even a call for yeas and nays.

The bill approved Jan. 29, 1827, donating lands to Kentucky, for a seminary of learning for the deaf and dumb, passed the Senate by a vote of 27 to 6; and we find such men as King of Alabama, Johnson of Kentucky, Benton of Missouri, Eaton and White of Tennessee, and Woodbury of New Hampshire, voting for the measure. In the House, the bill passed by 120 to 43; and among the yeas will be found the names of James Buchanan, James K. Polk, Cembreleng, Livingston, McDuffie, and Wickliffe. Surely these are no mean authorities on Constitutional questions, to be added to the names of Crawford, Monroe, Calhoun, Webster, Clay, and Clayton.

In 1838, a township of land in Florida was granted to Dr. Henry Perrine, to 'promote the cultivation of tropical plants'. In 1841, there was donated to each of the States 500,000 acres of land. The present law, now on our statutes at large, is that when duties are brought down below twenty per cent., the proceeds of the public lands are to be distributed to the States. Congress donated to the State of Tennessee, August 6, 1846, of unproductive lands lying in that State, 1,300,000 acres, on the condition that the State should endow and establish a college, at an expense of not less than \$40,000. Over 50,000,000 acres of swamp lands have been given to different States. President Taylor, in his message of 1849, says:

'No direct aid has been given by the general Government to the improvement of agriculture, except by the expenditure of small sums for the collection and publication of agricultural statistics, and for some chemical analyses, which have been, thus far, paid for out of the patent fund. This aid, in my opinion, is wholly inadequate.'

President Fillmore, in his message of 1850, says:

'Agriculture may justly be regarded as the great interest of our people. Four fifths of our active population are employed in the cultivation of the soil; and the expansion of our settlements over new territory is daily adding to the number engaged in that vocation. Justice and sound policy, therefore alike require that the Government should use all the means authorized by the Constitution to promote the interests and welfare of that important class of our fellow-citizens. And yet it is a singular fact that whilst the manufacturing and commercial interests have engaged the attention of Congress during a large portion of every session, and our statutes abound in provisions for their protection and encouragement, little has yet been done directly for the advancement of agriculture. It is time that this reproach to our legislation should be removed; and I sincerely hope that the present Congress will not close their labors without adopting efficient means to supply the omissions of those who have preceded them.'

The Constitutionality of a measure does not depend upon the amount, but upon the principle involved. The citations may show that there is a great preponderance, almost uninterrupted from the foundation of the Government, of executive, legislative, and judicial authority, to prove that the power of Congress to dispose of the public lands at its discretion is plain, absolute, and unlimited. The derivative title to a moiety of the lands imposes a condition upon the disposal of that portion so derived - a condition itself persuasively urging our present object - which is 'for the use and common benefit of all the States.'

While agriculture has been a neglected field of legislation, it does not now call for the exercise of novel Constitutional power. Congress has long asserted the right to dispose of public lands to establish school funds and universities, and no one now questions the soundness of such a policy. This measure is but an extension of the same principle over a wider field - wider in its applications, but not wider in its amount, for the number of acres now proposed for all the States is scarcely larger than have been donated to individual States. It is general and not local in its reach. If we have power to make special grants, in particular and individual cases, we certainly have the power, and it would be far more just and expedient to exercise it, in its general application. Pass this measure and we shall have done

- Something to enable the farmer to raise two blades of grass instead of one;
- Something for every owner of land;
- Something for all who desire to own land;
- Something for cheap, scientific education;
- Something for every man who loves intelligence and not ignorance;
- Something to induce the fathers' sons and daughters to settle and cluster around the old homestead;
- Something to remove the last vestige of barbarism from our land;
- Something for peace, good order, and the better support of Christian churches and common schools;
- Something to enable sterile railroads to pay dividends;
- Something to enable the people to bear the enormous expenditures of the National Government;
- Something to check the passion of individuals, and of the nation, for indefinite territorial expansion and ultimate decrepitude;
- Something to prevent the dispersion of our population, and to concentrate it around the best lands of our country - places hallowed by church spires, and mellowed by all the influences of time - where the consumer will be placed at the door of the producer; and thereby
- Something to obtain higher prices for all sorts of agricultural productions; and
- Something to increase the loveliness of the American landscape. Scientific culture is the sure precursor of order and beauty. Our esthetic Diedrich Knickerbockers, who have no land, will have a fair opportunity to become great admirers of land that belongs to others.

Many of our wisest statesmen have denounced our general land system as a prolific source of corruption; but what corruption can flow from endowing agricultural colleges? Here is neither profligacy nor waste, but a measure of justice and beneficence. Without meaning to express my opinion for or against the Homestead policy, I ask, in all candor, what man is there in the whole length and breadth of our country, who would not prefer, if he could have his choice, such an education as might be obtained at one of these colleges to a warrant for 160 acres of land?

The persuasive arguments of precedents; the example of our worthiest rivals in Europe; the rejuvenation of wornout lands, which bring forth taxes only; the petitions of farmers everywhere, yearning for 'a more excellent way'; philanthropy supported by our own highest interests - all these considerations impel us for once to do something for agriculture worthy of its national importance.

By the recent statement of the Land Office, we have 1,088,792,498 acres of land to dispose of; and when this bill shall have passed, there will then remain about 1,083,000,000 acres. We shall still be the largest land-holder in the world, while confessedly we are not the best farmers. Let it never be said we are 'the greatest and the meanest of mankind.'

I now submit my substitute, and move that the bill be recommitted to the Committee on Public Lands; and upon that motion I demand the previous question."

In his history of the Michigan Agricultural College Dr. Beal quotes from a letter from Albert E. Macomber, who was a student at the college in 1857-59, the following passage regarding President Williams' contribution to Mr. Morrill's speech. "He spent a part of the winter of 1857-8 in Washington, laboring incessantly with members of Congress for the passage of the Morrill Bill; and in my judgment, furnished a good part of the material of Representative Morrill's speech made on the introduction of that bill in the House of Representatives." (271)

The substitute bill offered by Mr. Morrill differed from the original bill by the omission of all reference to the Territories and by the addition of a paragraph to Section 5, as follows:

"Fifth. When lands shall be selected from those which have been raised to double the minimum price, in consequence of railroad grants, they shall be computed to the State so selecting at double the quantity."

When the "morning hour" came around on April 22, the House resumed consideration of Mr. Morrill's bill. The question pending before the House was on seconding the demand for "the previous question". "This parliamentary motion had the effect, if adopted, of cutting off all debate such as is specifically provided for by the rules, and is an order to the Speaker to put to the House immediately all motions that are before it in regard to the bill, and these motions being disposed of, to take a vote upon the question." The demand for the previous question was not a debatable motion, and as it was ordered, 91 ayes and 61 noes, the main question, a definite vote on the bill, must occur.

The Speaker of the House ruled that the adoption of the motion to order "the previous question" did not deprive the number reporting the bill of an opportunity to be heard. Mr. Cobb, of Alabama, the chairman of the Committee adversely reporting the bill, was thereby entitled to the floor before the various motions concerning Mr. Morrill's substitute were put to vote. Mr. Cobb spoke, in part, as follows:

"Mr. Speaker, this measure has taken a strange course since it came into this House by report from the Committee on Public Lands. I was under the impression that other gentlemen besides the gentleman from Vermont (Mr. Morrill) would have an opportunity to address the House upon the question; but motion after motion has been made, until the question has been unexpectedly forced upon us for a direct vote. Of course, under the circumstances, I am compelled to occupy some time in opposition to the bill. My only object will be to state facts, for the information of members; and I will do so as briefly as I can. I do not think I will occupy half of the hour allotted to me under the rules.

In the first place, this bill was reported by the Committee on Public Lands adversely. If I could state how that vote stood in the committee it would astonish the country, taken in connection with the action of this House, so entirely different from the action taken by the Committee on Public Lands. It cannot be denied that the opinion prevailed during the last administration, while I had the honor of being a member of the Committee on Public Lands, that that committee did more business, and committed more high-handed plunder (I use that word) during the last session of Congress than any committee of the House ever before did. Though the opinion prevailed in the minds of many persons that the committee was guilty of those offenses, I deny it. We certainly did make liberal grants of land during the last Congress: and I voted, with two exceptions, for all of them. I am satisfied with the action of the committee at that time.

* * *

Every Member of the House undoubtedly understands what the bill proposes to do; and therefore I shall consider it very briefly. I wish to show from the report I made, that it is not, nor has it been, the policy of this Government, with one or two exceptions, to grant lands for such public purposes. The bill proposes an inauguration of a new system, the result of which no man can foresee. Certain it is that the result will not be a good one.

As to the propriety of making a grant of lands for such purposes, I refer to my report, and I propose to read it as a part of my speech. This is the report:

The Committee on Public Lands, to whom was referred a bill (No. 2) making a grant of land to the several States and Territories of the Union, for the benefit of agriculture and mechanic arts, beg leave to make the following report:

That they unite with the friends of the bill in appreciation of the merits of the object to which the proposed grant is intended to be applied; and if those merits could alone determine the conclusions of the committee, they would most cordially recommend the passage of the bill. In the judgment of your committee, however, there are other considerations which demand attention before they can come to that conclusion. The general Government is one of limited powers. At its formation, the respective States, as separate but independent communities, were amply empowered to regulate and provide for all matters within their limits; but a sense of weakness,

as against foreign powers, impelled them to a confederation and the formation of a government competent to the general protection. To this end, and for this purpose, special powers were conferred upon it. But while the States constituted the authority which was deemed necessary to the ends for which it was formed, they did retain within themselves all the powers necessary to the independent management and control of matters not involving the interests of the citizens of the other States. Competent as they were to all domestic matters, they only sought to establish a Government which should provide for the interests of the Confederation in its aggregate capacity; and, jealous of their separate independence, the States reserved to themselves, respectively, all power not necessary to the General Government for the end for which it was formed.

This limitation of power in the hands of the federal Government, except so far as specifically granted, denied to it all authority to act in relation to the domestic affairs of the several States, and has established the only solid foundation for the perpetuation of the Federal Union. Under this principle its limits may forever be extended, and its safety preserved. Various, and even conflicting, habits, customs, and local interests, in the different States, will be protected by their legislators, and are in no danger of being over-ridden by the federal Government; and, if it keeps within its appropriate sphere, the prosperity of the States will be secured, and the interests of the Union will be enlarged. Such is the symmetry of our Government, its very existence depends upon its severe adherence to the limitation of its duties. Within that, it has no power but to bless: beyond it, it has no power but to ruin. This limitation is the anchor of our safety; when it falls, it will involve the ruin of the Republic. If the General Government possessed the power to make grants for local purposes, without a consideration, within the States, its action, in that respect, would have no limitation but such as policy or necessity might impose. Every meritorious object would have a right to demand it; and to such a refusal could only be justified by inability. Every local object for which local provision is now made, would press for support upon the General Government, and would create demands beyond its power to meet, and, of necessity, it would be driven into the policy which would increase its means. As its expenditures are increased the revenue must be enlarged, and the ~~people-of-the-Union~~ General Government, by the adoption of the policy, would levy taxes upon the people of the Union for the support of the local interests of the States. If their expenditures should be unequally apportioned, the injustice of taxing a part for the benefit of others would soon cause the system to be overthrown. If they were equally distributed, it would be but a usurpation of the functions of the State, unsustained even by the plea of economy. The patronage would be fatal to the independence of the States: with patronage comes the power to control, as consequence follows upon cause.

If the policy is embarked in, what shall be its limits? Shall the merit of the object and the ability of the Government be the boundaries of its action? To feed the hungry and clothe the naked, if within its competency, would, in a moral point of view, be quite as meritorious as any other act which the Government could perform, but, if the Constitution had granted power for such a purpose, would it be politic for Congress to make provision for the suffering poor throughout the Union? If either lands or money could be granted for the purpose designated in this bill, could they not, and ought they not, to be granted to the building of churches, erecting schoolhouses, and the keeping up the common schools in States and Territories? If to one meritorious object, why not to another? or shall the action of Congress in this regard be extended to every useful public and private purpose within the States? If not, where shall the line be drawn? If the principle be admitted, what shall limit its application? Your committee have failed to perceive

how they could be justified in recommending a grant from the General Government in support of agricultural schools, and in refusing one for any other object equally meritorious. The means of the General Government are taken from the people; if you take from it the public lands, you give it money in the stead; if you destroy its revenue from that source, you must increase it in some other. No more expensive mode could be devised to support local institutions than to make the Federal Government the agent to raise and distribute the means. With the States lies the power necessary to their management and control. With the States lies the power to secure an economical administration of the funds, and to determine the amount which prudence will allow to be expended in their support; and if these institutions are supported by means raised by the authority of the States, no injustice can be inflicted upon the people of the other States. Such provision, as between the States, would be just from necessity, and from interest it would be economical. The appropriation asked for is in lands, but your committee can discover, in this regard, no difference between an appropriation in lands or one in money; the effect is precisely the same in both cases. If the revenue from the public lands is destroyed, the deficiency must be met by tax on the people.

The public domain belongs to all the people of the United States; their interest in it is common, and the Government is but the trustee for the common benefit, limited in its actions over it to those powers conferred by the Constitution. It is a part of the public funds, and can be devoted to no purpose forbidden to the money of the Federal Government. If Congress impairs its value it must receive a compensation, or it will be faithless to its trust. The public good forbids the Government from extorting from the purchasers the exorbitant price for the public lands; but while the public welfare limits it to a reasonable action in this respect, the public rights demand that some compensation should be exacted, and such a reasonable revenue be secured from the public domain as, without being oppressive upon the purchasers, should be equitable towards those who had not obtained the enjoyment of the soil. Such are the principles, the recognition of which justice imperatively demands. As a land-holder, the Government may legitimately bear a share of the burden imposed, to create an improvement which will enhance the value of its domain, and may contribute to that end; yet its aid must be limited within the extent which does not require taxation to effect it. It may, as a matter of power or right, contribute portions of the public lands to improve the value of the remainder; but even in this, sound policy and its duties towards the general welfare will limit it to a healthy and reasonable extent. Reasonable donations towards improvements which cause an increased value in the adjacent lands are consonant with a wise and just administration of the public domain. Such donations increase, and not impair, the value of the trust; but a gift which reduced the value of the public lands, is in violation of the beneficiaries' rights. The donations of section sixteen for the support of the township schools was an inducement to purchasers, and enhanced the value of the adjacent lands, the sale of which indemnified the Government for the donation which it made. So, too, the donation of the salines. The facilities for obtaining salt were among the first objects of the early settlers upon the public lands, and the donation of the salt springs, and adjacent lands, to cause their being worked, was a powerful inducement to the pioneers of the West. The grants to the new States; upon their admission into the Union, were upon conditions which more than indemnified the Government.

The swamp-land grant was justified, because it wasto remove a nuisance which injured the public and the Government as the proprietor of the adjacent lands; while the grants for internal improvements brought a direct pecuniary profit to the Treasury. Your committee are aware that a few instances can be found where the action of Congress has not been limited to the principles which we avow, but, in our judgment, these instances warn us against them as precedent of wrong.

1940-1941

1942-1943

1944-1945

1946-1947

1948-1949

1950-1951

1952-1953

1954-1955

1956-1957

1958-1959

1960-1961

1962-1963

1964-1965

1966-1967

1968-1969

1970-1971

1972-1973

1974-1975

In extreme cases the laws are silent, but the cases form no rule. In ordinary cases, when the precedent is wrong, it should be condemned. It is always an ungrateful task to refuse; but when duty demands it, our committee feels that it dares not disobey. Our sympathies impel us to extend a generous support towards some of the objects for which donations of the public lands are asked. If our feelings could control, we should most cordially do all that their friends could desire; but we live under a Government of laws, and the merit of the object cannot justify the appropriation of means not our own. Want seldom inquires into the right of plenty to give - its own necessities are its highest law. The ability of the General Government naturally causes applications to it for assistance; and without inquiring into its right to comply with their demands, the needy press upon the Government for support. To support local institutions does not come within the scope for which the General Government was formed: and, if it possessed the power, your committee can imagine no policy more unwise. The public domain is a source of revenue. In time of war it is one of the most effective means upon which the country can rely; it will secure enlistments when money fails; and, in our opinion, we should indeed be careful before we destroy this important aid. The public lands are watched with a longing eye.

Your committee have now before them, exclusive of the cases where there is a promise of compensation, applications for grants of lands, money, and other objects, the most of which, if not all, we feel bound to reject. Our land system has been well and happily devised - under it, injustice has been to but few, but most have prospered. It has furnished a moderate revenue without preventing the settlement and improvement of the domain. New States have sprung up on it, whose property is the admiration of the world. Industry has the price of the public lands within its reach: and the policy which made it has caused the wilderness, not only to bud and blossom, but to bring forth fruit. The new States have been encouraged: the old States have had their interests secured: the spirit of our Government has been obeyed, and its duties kept within the limits of the law. Shall all this be disregarded, and the system overthrown? For what? If the prayers of the petitioners were granted, the prodigious quantities of land which would be thrown upon the market by competing vendors would deprive it of marketable value. The very gratification of their wishes would destroy the objects they have in view. To make the grants would be to render them of but little value. Your committee conclude that Congress, without a promise of pecuniary compensation, has not power to grant portions of the public domain: and if it had, no policy could be more unwise than to grant it for the support of local institutions within the State. They therefore ask leave to report adversely to the indicated bill.

All of which is respectfully submitted,

W. R. W. Cobb,
Chairman of Committee on Public Lands.

It remains to me only to allude to the effect of this bill. How much land do you suppose the State of New York would get under this bill? 20,000 acres to each Representative would give to the State of New York, which has an area of 29,440,000 acres of land, 700,000 acres. I mean to say, that if the bill passes - but I have no fears that it will pass - though there are several other ordeals which it will have to pass through before it becomes a law - it will give the State of New York 700,000 acres of land. Iowa, with an area of 32,548,960 acres of land, gets, under this bill, 80,000 acres, while she is susceptible of having her whole territory filled up, and of sustaining a population as large as that of New York. Then you see how unequally this bill operates. Iowa gets 80,000 acres, and New York gets 700,000. Do gentlemen expect that they will be able to get a supplemental bill passed after a while, so as to place their States on an equal footing with other

States, such as New York? I doubt it very much. California has an area of 287,162,240 acres of land: and under this bill she only gets 80,000 acres. Will California sell her birthright for a mess of pottage, as Alabama has often done in the votes of her Representatives for railroad grants? Arkansas, with an area of 33,406,220 acres, gets, under this bill, 80,000 acres, while her population will probably be trebled or quadrupled in twenty years.

From the best sources of information now at hand, the present population of Michigan is 800,000; Wisconsin, 750,000; Iowa, 600,000, and California, 600,000. Here these four States, with an aggregate population of 2,750,000, would at this time, by an equal distribution upon the present ratio of representation, be entitled to 640,000 acres; yet under this bill they get but half that amount. And yet these facts do not truly present the unfairness of the distribution by this bill; for while the new States, by the rapid increase of their population, are entitled to more, the old States are entitled to less representation in Congress. Therefore, in this ninth year of the present decade, Congressional representation is no fair basis upon which to make a distribution of public lands for agricultural colleges, or any other purpose.

And that brings me to another point. The gentleman proposes by his amendment to exclude Territories from the benefit of this bill. Utah, with an area of 140,925,440 acres, would have got, under the original bill, 20,000 acres; but according to the amendment, will get nothing. So with Minnesota, with an area of 90,776,960 acres, and which might be entitled as a State, within a few days after the passage of this bill, if it do pass, to 80,000 acres. So with Washington Territory, with an area of 80,000,000 acres: and with Oregon, with its 125,000,000. I will not say anything about Kansas, lest I might disturb the harmony of the House.

* * * * *

The Committee on Public Lands have determined, this session, to husband the public lands as much as possible: but, notwithstanding that, this bill proposes to give away some 6,000,000 acres to the States, while the Territories are altogether overlooked. You find the Territories often neglected in this way: but, whenever they come in as States, and have their Senators in the other branch of the National Government and their Representatives here, then their rights are respected and their political favor courted. I am ashamed to say that I have myself often neglected the Territories because they have no vote. But it was wrong: and I censure my own action on former occasions, and admit that it was wrong.

Now, one more word, and I will close. When Members of the House and the people of the country come to read the report on the bill, and see the position I assume in it, and remember my votes in relation to grants of lands for railroad purposes, they may be curious to know how I can reconcile my vote against this bill, meritorious as it is, with the votes which I have given in favor of those railroad grants. It is a very easy matter for me to reconcile those votes to my own satisfaction; but, whether I shall be able to satisfy everybody else, it is not for me to determine. I hold that the grants to States and Territories for railroad purposes increase the value of the public lands; and they not only increase their value by promoting settlement, but they bring into market thousands and millions of acres of public lands that perhaps would not otherwise get into market for sixty years. The Government, therefore, receives an equivalent for the lands granted; but in this case the Government is to receive no consideration whatever - not one dollar. And not only that, but the States which receive the lands are to be taxed to the amount necessary to build these institutions; for they are not to be allowed to apply any of the proceeds of the sales of the lands, either the principal or the interest, to the erection of the buildings, and so forth, for these colleges. I can well understand why the friends of the bill from the State of New York are in favor of it:

they have their agricultural college already established, and, under this bill will get 700,000 acres of land to aid them. In Michigan I understand that the same is the case. The State has already been at the expense of establishing the institution.

But, Mr. Speaker, I have a still more difficult job before me, and that is to reconcile the vote which I shall give in relation to this bill with the vote which I gave upon another bill. And I cannot perform it without simply coming down and acknowledging frankly that I was wrong in the votes which I gave, when the impulse of this heart, whether good or bad, prompted me to act in behalf of the proposition to grant lands for the establishment of insane asylums in the States - a proposition gotten up by Miss Dix. I do not know from what portion of the country she comes: but she is a meritorious, generous, and noble-minded woman. She went down into my State, and her charms had such an extra-ordinary effect upon the people of that portion of the country that the Legislature of my State adopted the joint memorial to the Congress of the United States, without a dissenting voice, requesting their representatives and instructing their senators to vote for that bill. Then it was, sir, that I gave way to my better feelings, and voted for that bill. I had not examined the Constitutional question as thoroughly as I admit I ought to have done; when the President's veto came in, and I did examine it, I became perfectly satisfied that I had voted wrong. I have the consolation of knowing, however, that my motives were good. I have the consolation of knowing that my erroneous action arose from the impulses of a kind and generous heart, and from a desire to aid the unfortunate class for whom that bill proposed to provide. I acknowledge, today, that I did wrong, so far as the Constitutional question is concerned; but my own heart told me that the measure was right in itself, and the gratification and approval of my own heart amply compensate me.

But, Sir, I am going to leave this question. I suppose that, if this bill passes, the people of every State will have a right to ask Congress to provide for their common schools and other local institutions; the poor will have a right to come and ask Congress to grant lands to aid in the erection of buildings to shelter them from the inclemency of the weather.

After the speech of Mr. Cobb, the Speaker put to the House the pending motions. The first was Mr. Morrill's to recommit the bill with his substitute to the Committee on Public Lands. As the adoption of "the previous question" enabled Mr. Morrill to get an immediate vote on the bill as a whole, it was bad parliamentary tactics to press the motion to recommit it. Mr. Morrill endeavored to withdraw this motion but was unable to get consent as many of the House members had been angered at the cutting off of all debate and opposed his desire. As a result, Mr. Morrill was obliged to appeal to his friends to defeat a motion offered by himself. This move was successful and the motion was lost by a vote of 93 yeas and 105 nays. The substitute to the bill in form of an amendment, which, by the way, had never been before a committee, was then agreed to. The original bill as amended was then engrossed and read for the third time when the main question was

ordered to be read. On a call for the yeas and nays on the passage of the bill, and so ordered, the question was taken and decided in the affirmative - yeas 105, nays 100. In this manner the bill was passed in the House of Representatives.

In the Senate the college land-grant bill was referred April 23, 1858, to the committee on public lands, of which Mr. Stuart of Michigan, a firm friend of the measure, was chairman. The committee could not agree and reported the bill back to the Senate without recommendation. Mr. Stuart made several unsuccessful attempts to bring it up but Congress adjourned without action. When the Senate reconvened in December, Mr. Stuart immediately announced that he would call up this bill but his attempts to do this on December 15, 16 and 23 were again unsuccessful.

Then Senator Benjamin Wade, of Ohio, took charge of the bill and on February 1, 1859, succeeded in bringing it before the Senate where discussion on it ran over into the next day and resulted in its recommitment to the Committee on Public Lands on motion of Senator Pugh of Ohio, who was strongly opposed to it. On February 3, this vote was reconsidered and February 7 the bill was again discussed at great length and finally passed by a vote of 25 to 22. Among the active opponents of the measure were Senators Clay of Alabama, Green of Missouri, Mason of Virginia and Jefferson Davis of Mississippi. Their chief arguments were based on its alleged unconstitutionality. Senator Clay summed these up when he called attention to the fact that only a few Democrats favored the bill and reproached them because they were going contrary to their professions "to be advocates of State rights; of a strict construction of the Federal Constitution; opposed to enlarging Federal powers by construction; in favor of the largest liberty of the States consistent with the prohibitions of the Constitution; opposed to the distribution of the proceeds of the public lands; in favor of the principles and sentiments enunciated by General Jackson in his veto of the land distribution

bill; opposed to any intervention by Congress with the domestic affairs of the States; and in suffering them to manage their own internal and local affairs in their own way, subject only to the Constitution."

Senator Gwin of California was opposed because mineral lands were included and Rice of Minnesota, because he believed that the locations of lands in his State would be injurious to its interests. Among the strong supporters of the measure were Harlan of Iowa, Simmons of Rhode Island and Collamer of Vermont.

President Williams of the Michigan Agricultural College, Cary of Ohio, Kennicott of Illinois, Amos Brown of New York, M. P. Wilder of Massachusetts, L. C. Byington of Iowa, D. P. Holloway of Indiana, W. F. M. Arny of Kansas, representatives of the Pennsylvania College, and others were in Washington and did much to aid Morrill in securing the passage of the bill by furnishing material for its defense and by soliciting the support of members of Congress. Evidently the personal canvass was efficient and there were a sufficient number of definitely pledged Congressmen to insure the passage of the bill by a small majority. Turner and his associates in Illinois and elsewhere were active by correspondence. Influence was also brought to bear on President Buchanan in the hope of preventing a veto. Resolutions and petitions from State legislatures, agricultural societies and other sources came in great numbers from all parts of the United States. It has not been practicable to get a complete list of these but at least 45 have been noted. Mr. Morrill stated in February, 1859, that such papers had come from at least thirteen State legislatures.

The greatest hope that President Buchanan would sign the bill^{lay} in his vote in Congress in 1827 in favor of a bill to grant public lands for a deaf and dumb asylum in Kentucky. Such a vote was also an embarrassment to other opponents of Morrill's bill and one of them said frankly that this vote was an error which ought not to be repeated. The President evidently accepted this view of that matter. On February 26, 1859, he returned the Morrill land-grant bill to the House of Repre-

sentatives with a veto message. His reasons for refusing to sign the bill and Mr. Morrill's rejoinder have been well summarized by Dr. Powell of the University of Illinois as follows:

"It was extravagant as its effect would be to deprive the almost depleted treasury of the \$5,000,000 which the sale of public lands was expected to produce during the next fiscal year; it was impolitic because it would encourage the states to rely upon the federal government for aid to which they were not entitled; it was injurious to the new states since it would force down the value of land scrip and make it possible for speculators to obtain large tracts within their borders; it was insufficient to assure the promotion of industrial education because, although the state legislatures were required to stipulate that they would apply the land to the purpose for which it had been granted, there was no power in the federal government to compel them to execute their trust; it was unjust since it would interfere with and probably injure colleges already established and sustained by their own effort; it was unconstitutional since there was no grant of power to the federal government to expend public money or public lands for the benefit of the people in the various states.

After the president's message had been delivered Morrill moved that it be printed and then in a brief but forceful address asked the reconsideration of the bill. He declared that the veto of a bill introduced without regard to party lines and carried on its own merits through both houses, "pressed by petitions and Resolutions from the Legislatures of at least thirteen States, and by an indefinite number of memorials from private citizens" had been a serious blunder if not a crime. He then took up the reasons for the veto as they appeared in the message and answered them one by one. He evidenced his belief that the president's action had been impelled by political considerations, sarcastically suggesting that the financial objection came "with all grace from a Magistrate who has wasted more than ten million dollars in a grand march of the army to Utah, who is wasting a larger sum by the grander naval demonstration against Paraguay, and who would waste \$30,000,000 more in the grandest of all propositions - the snatching of Cuba." He pointed out that there was no probability that the national treasury would suffer during the current year since it would require at least a year or two for the states to pass the legislation necessary to take advantage of the land grant. He asserted that there was nothing in the principle of federal aid to industrial education in each of the states that was more likely to cause a request for unwarranted favors from the central government than might be found in the idea of national support to state deaf and dumb hospitals to which "James Buchanan" and other prominent democrats gave their hearty support twenty years earlier. He showed that Jackson had vetoed a land bill in 1833 because it had given twelve and a half per cent more land to the new states than to the old, but declared that "this bill does not equal and exact justice to all the States according to the census of 1850; and it further provides, that if, by the increase of population, the new States, or any States, shall have an increased representation in Congress in 1860, they shall receive twenty thousand acres for each additional Representative they may then be entitled to. I therefore contend that there is a discrimination rather for the benefit, than the injury, of the new States, to which this provision would only practically apply. Thus Democratic Presidents differ - agreeing only in the veto, by which the will of the people, as expressed by their Representatives here, shall be crushed out. One is for justice for the old States, and the other for justice to the new States, but neither for justice to all."

In defense of the educational features of the bill Morrill said: 'The president wholly mistakes the object of the bill which was to offer free tuition to the boys of farmers and mechanics - not to enrich corporations and endow professorships - and to enable them, by their own industry, to acquire what might not otherwise be within their reach - a liberal education. One great object was to arrest the degenerate and downward system of agriculture by which American soil is rapidly obtaining the rank of the poorest and least productive on the globe, and to give it to farmers and mechanics that prestige and standing in life which liberal culture and the recognition of the Government might afford. To all this the President turns a deaf ear.' He then took up the argument that the land might not be used for the purpose to which it had been appropriated once it had passed beyond the control of the central government. He pointed out that the states were pledged to hold the land in trust for a specific object and that the objection that the federal government lost the opportunity to compel the use of the lands for the intended purposes conflicted with the wish, expressed in the same message, that the affairs of state and central governments be kept apart. Turning to the possibility of injury to already established colleges and to the president's suggestion that it were better to establish professorships of agriculture in such institutions Morrill again gave his anger toward Buchanan full play; 'What constitutional difficulty would thus be avoided, I confess, is to me incomprehensible. The wisdom of the suggestion and its feasibility clearly belongs to the President alone. If the object be to excite the jealousy of existing colleges, it is unworthy of notice. I know that the friends of such institutions, men of thorough education, are, in all sections of the country, the cordial and devoted friends of this bill. I do not understand this hint in any other sense than this: that the President was not consulted in regard to the principles of the bill. Had he been thus consulted, or had the details, even, been prepared by some Democratic member, then it might have received his assent.'

Finally Morrill turned to the constitutional objection; he called attention to the fact that the constitution gave Congress the power to dispose of the public lands, and that such a power was absolute and unqualified; he ridiculed the inference that to give was not to dispose and he expressed his amazement that a man who had voted public lands to the use of the insane should now find a similar measure for the benefit of the sane to be unconstitutional." (182)

When the final vote was taken, 105 representatives voted for and 94 against this measure and thus the veto was not overruled. The bill received, however, the same number of favorable votes as in its first test in the House.

The Second College Land-Grant Bill

Though greatly disappointed at the unsuccessful outcome of the great and widespread efforts in behalf of the first college land-grant bill, the friends of this measure did not lose all hope of the final passage of a similar measure.

A presidential election was coming on and its result might turn the scale in favor of such a Federal grant for education. The United States Agricultural Society discussed the matter at its meeting in Washington in January 1860, but an attack by one of its members on President Buchanan prevented favorable action. In Illinois the State agricultural and horticultural societies joined in calling a meeting at Bloomington, June 27, 1860, to which representatives of all agricultural, horticultural and mechanical associations in the State and all individuals interested in agricultural education were invited. The following resolution prepared by a committee of which Turner was chairman was adopted:

"Resolved, That this convention hereby request the executive committees of our State Agricultural and Horticultural Societies to appoint a committee, whose duty it shall be - 1st, to memorialize Congress to grant to each of the States of the Union such aid as was contemplated in the bill called the 'Morrill Bill', which passed the House and Senate at a recent session; 2nd, to memorialize and urge upon our State Legislature, to renew their petition to Congress, for the same substantial aid; 3d, to urge the establishment by the State Legislature of a school or department of agriculture, under the general direction of a board appointed conjointly by the same State Agricultural and Horticultural Societies for this purpose; 4th, to provide courses of lectures on agriculture and horticulture, similar to the course at the last session in Yale College, to be delivered at such times and places as they shall deem most fit, and to take measures needful to secure these results." (182)

Believing that Abraham Lincoln would be nominated for President of the United States, Turner asked him to support the college land-grant bill. Lincoln is said to have replied - "If I am elected I will sign your bill for State universities." Stephen A. Douglas also assured him: "If I am elected, I will sign your bill." He followed this up after his defeat by writing Turner in June, 1861, for his plan for an industrial university and its history in order that he might introduce a land-grant bill at the next session of Congress. His death prevented even a reply to this friendly message.

When Congress met in December 1861 Mr. Morrill gave notice that he would again introduce a college land-grant bill and this was done on December 16. The bill was referred to the committee on public lands, of which Mr. Potter of Wisconsin was chairman. This was a very different committee from the one which had considered the previous bill. Two elections had changed its complexion completely and its personnel had been materially reduced by the withdrawal of one of the National parties from Congress. A new party had also come into power. This committee nevertheless was adverse to federal grants for vocational education, especially since this proposition had not been received favorably by most of the state legislatures. Mr. Potter was therefore instructed to report the bill adversely but in so doing on May 29, 1862, gave no reason for this action. Mr. Morrill did not attempt to have the bill considered in the House at this time because a similar bill introduced in the Senate had been favorably reported there. He asked leave on June 5 to print a substitute bill but this was refused on objection by Mr. Holman of Indiana.

Meanwhile Senator Wade of Ohio, probably by arrangement with Mr. Morrill, had introduced a similar bill in the Senate on May 2, 1862. This was referred to the Committee on Public Lands of which Senator Harlan of Iowa, a friend of this measure, was chairman. It was favorably reported May 16, with two amendments. Opposition then centered in Senators Lane of Kansas and Wilkinson of Minnesota.

Senator Lane on May 21 offered an amendment which would have prevented purchasers of the land scrip granted to the states under this bill from locating any lands within the states, though they could locate it in the territories. He supported this amendment in a long speech in which he claimed that the language used in the original bill would throw into the hands of non-residents every foot of valuable public lands in Kansas before the state could select her school lands or get her share of railroad lands.

"We shall have entire counties thus held without a possibility of getting a school, without a possibility of working roads; and shall I tell any western man here the terrific consequences growing out of lands held in large quantities by non-residents? You are to inflict this damage upon Kansas, and exclude her from her school lands; and let me say to my colleagues that if you pass the Pacific railroad bill pending, every acre of desirable land in the State we represent will be taken under the provisions of this bill, and our children will be left without schooling, and we shall be left without land to build railroads in our state."

Mr. Pomeroy of Kansas also favored this amendment because Kansas had not received the usual amount of public lands.

The effect of the land-grants in this bill on the new western states was further discussed on May 22, 24, 28 and 30 and on June 10. Mr. Harlan on May 24 showed that Congress had been very liberal in making large grants of lands for various public purposes to the "land states".

"All of the older land States are entitled to the sixteenth section in each township, which is one thirty-sixth part of the entire area of those states. Each of the newer land States - Minnesota, Kansas, California, and Oregon - is entitled to both the sixteenth and thirty-sixth sections, being one eighteenth of the entire area. Each of the land States is also entitled to five hundred thousand acres of land under the act of 1841. They are also entitled to seventy-two sections each, to aid in the organization and support of colleges. They are entitled to select twelve salt springs, with six sections of land adjacent to each, amounting in the aggregate to seventy-two sections of the public lands in each State. They are also entitled, under another act of Congress, to ten sections of land each to aid in the erection of public buildings. They are also entitled to all the land denominated swamp or overflowed lands. They have also received large grants to aid in the construction of railroads. Many of them have received large grants of land to aid in the improvement of rivers, and to aid in the construction of canals. They are also entitled to five per cent. of the net proceeds of the sales of public lands within their limits, made after they enter the Union."

"There are in Kansas, in the entire area of the State, 52,043,194 acres. I infer from my general knowledge of the character of the State, that the entire 10,000,000, if so much should be granted under this bill, might be located in that State, and an immense amount of valuable land still remain. There is, however, no probability of any very considerable proportion of this scrip being located in Kansas more than other landed States. Although it is a beautiful State, and the land is excellent, yet it is no better than the land in Minnesota, in Iowa, and probably in Nebraska and other landed States and Territories.

This bill proposes to grant to the States less than 10,000,000 acres. We now have, of surveyed and unsold lands, over 134,000,000 acres. About sixty-five millions of acres of these lands have been exposed to sale at a public outcry, and are now subject to sale at private entry. The remaining surveyed lands will soon be in the same condition. Deduct the entire grant contemplated by this bill, and there will remain of the surveyed public lands more than 124,000,000 acres. But, sir, I find by the table to which I referred a few

minutes since that the total unsold and unappropriated public lands belonging to the United States, offered and unoffered, on the 30th day of September, 1861, amounted to 1,046,290,093.16 acres - more than 1,000,000,000 acres of public lands. This bill proposes to take less than 10,000,000 of that more than 1,000,000,000 and give it to the States, as trustees, to be used for the education of their agricultural people. The comparative amount is trivial. The object is certainly commendable. And the new States will derive an advantage from the expenditure of the proceeds of the sale of these lands within the old States; for we will receive a very large per cent. of the active young men that are to be educated in the colleges contemplated by this bill. And it is as well that they should be educated at home before they emigrate."

Nevertheless the feeling among Senators from the new States that too much land granted under this bill might be located in single States led to the introduction of the following amendment:

"And provided further, That not more than one million acres shall be located by such assignees in any one of the States: And provided further, That no such locations shall be made before one year from the passage of this act."

This amendment was supported by Mr. Wilkinson, who expressed his belief that without it the bill would interfere with the operation of the homestead act which had just passed Congress and that speculators would get the scrip and locate the best lands, against the interests of soldiers serving at this time in the Union Army.

So much sentiment in favor of this amendment was aroused in the Senate that Mr. Wade who was in charge of the bill said on May 30 that he would not oppose it. There was also considerable reluctance to bring this measure to a vote and it was not until June 10 that Senator Wade was able to secure its final consideration. The amendment of Senator Lane that not more than one million acres of land should be located in any one State and not until one year after the passage of the bill was adopted, together with an amendment offered by Senator Collamer of Vermont that

"No State shall be entitled to the benefits of this act unless it shall express its acceptance thereof by its legislature within two years from the date of its approval by the President."

An amendment offered by Senator Pomeroy of Kansas that all scrip issued should bear upon its face a statement that it was issued under this law, that no assignment of the scrip should be valid unless it was annexed to the face of the scrip and

furthermore that no one person should receive an assignment of more than 640 acres, was adopted by a vote of 20 to 19 and then reconsidered. Discussion having died down Senator Wade forced a vote, which was 32 to 7 in favor of the amended bill.

Mr. Morrill, now one of the leaders in the House, called up the Senate bill June 17, when Messrs. Potter and Holman tried to have it referred to the Committee on Public Lands or to postpone the vote. But Morrill would not consent and finally secured a vote. It was passed by a vote of 90 to 25 and the long struggle to obtain this land grant for colleges was over. President Lincoln signed the bill July 2, 1862, having already on May 15 approved the bill creating the United States Department of Agriculture. This was also the day when the army of the Potomac began its retreat after the disastrous battle of Malvern Hill, and the fortune of war seemed to be against the preservation of the Union. The act of 1862 was practically the same measure as the bill of 1857. The important differences were the omission of the Territories, the increase of the land-grant for each member of Congress from 20,000 to 30,000 acres, the exclusion of the benefits to States while in the act of rebellion, and the requirement to teach military tactics.

Amendments to the act of July 2, 1862 were made by Congress in the act of March 3, 1883, which permitted States having no State stocks to invest the proceeds of the sale of the land scrip "in any other manner the legislatures of such States shall have assented thereto" and engaged that this land-grant fund shall yield not less than 5% and that the principal shall forever remain unimpaired, and the Act of July 23, 1866, extending the limit of the time of acceptance of land-grant to three years from the passage of this act, and the establishment of the colleges to five years after the filing of the acceptance in the General Land Office, and providing that when any Territory shall become a State, it shall be entitled to the benefits of this Act by expressing acceptance within three years after its admission to the Union and providing a college or colleges within five years after such acceptance

and providing further that any State which has heretofore accepted the act shall have five years to provide at least one college after the time for doing this named in the act of July 2, 1862 shall have expired.

The Intent of the College Land-Grant Act.

As soon as the Morrill land-grant act was passed, and even up to the present day, questions have been raised as to its real intent. Professor William H. Brewer, who in 1864 became professor of agriculture in the Sheffield Scientific School, made the following statement regarding these problems:

"In Connecticut many questions arose immediately as to the details of the intent of the Act. The same (or similar) questions arose in other States, both those with colleges already formed, and in those States building new colleges and universities, according to the conditions existing in the several States. Many plans were proposed both as to the disposal of the funds and the methods of instruction to be given. Suggestions, theories, and schemes were proposed by educators, enthusiasts, cranks, associations, legislators, etc., as to how the Grant might be used, how it could be used, how it ought to be used, what was the intent of the law, what was the spirit of the law in which it should be interpreted, and what the letter of the law which must be obeyed.

In nearly every State there were many propositions as to how this gift could be used to the best advantage. Some advisers would have a purely agricultural school and separate purely technical school. Others advocated that the two should be combined.

Some advocates would have Manual Labor schools and Trade schools united, or separate. Some would use the income from the Grant in one large college of high grade; others, divide the fund and make several lesser institutions of lower scholastic grade. Some would divide it still more widely and appoint special professors in several schools of the State. Some would apply it largely to lectures before mechanic associations and agricultural societies, and others would devote a considerable portion of it to itinerant lecturers.

One eminent writer on agricultural matters would have it used for the wider dissemination of the regular Agricultural Newspapers, and so on through schemes too numerous to enumerate.

Our school, however, was already in actual operation before the Bill passed; and various new problems soon presented themselves, such as: How should Military instruction be given? How much Manual Labor as a part of the required curriculum? How about a farm to teach the art of Agriculture in addition to a school of science to teach the principles, etc.

Each and every State had similar problems." (19)

For an interpretation of the law it is natural to turn first to its author.

In the elaborate speech which Mr. Morrill made when his bill was before the House of Representatives in 1858 he frequently uses the term "college" to denote the

institutions to receive the benefits of the bill. The grade of these institutions is indicated in the following statement:

"Let us have such colleges as may rightfully claim the authority of teachers to announce facts and fix laws, and to scatter broadcast that knowledge which will be useful in building up a great nation."

After referring at some length to the agricultural colleges and schools in European countries he says that there are so many farmers to be educated in this country that the colleges provided for under this bill "will hardly do more for some years than to supply teachers that will be required for secondary schools..". He mentions the Michigan Agricultural College and evidently considers it in the class of institutions to be benefitted by his bill. That he expects such institutions to provide distinctive instruction is clear from his statement that agricultural colleges and "literary" colleges "move in separate spheres". He clearly expects the land-grant colleges to advance knowledge by experimental inquiries.

"We need a careful, exact and systematized registration of experiments, such as can be made at thoroughly scientific institutions and such as will not be made elsewhere."

This is followed by a considerable list of the agricultural experiments needed. These institutions may not be able to discover means for controlling cotton or wheat insects but "some resulting improvements may safely be predicted upon the labors of 32 or more institutions actually engaged in scientific agriculture." As regards the education of mechanics "let us furnish the means for that art to acquire culture, skill and efficiency."

In 1867 Mr. Morrill was invited to visit the Sheffield Scientific School in order that the faculty there might "talk with him regarding his intent in planning the bill, and his interpretation of the law." The following summary of the conference there is taken from notes made at that time by Professor Brewer. (19) Professors Brush, Lyman and Brewer met Mr. Morrill at the residence of Professor Gilman (afterwards president of Johns Hopkins University) and "talked over the whole matter", and the next day Professor Brewer had further conversation with him.

Mr. Morrill wished the bill to be broad enough so that the several States might use it to the best advantage. For this a wide latitude of use was necessary. The general wants and local conditions were very different in the different States and for the best use of this fund there must be much variety allowed in the details, although all the colleges should be the same in spirit and essentially of the same grade, that is -- colleges, in which science and not classics should be the leading idea.

He did not intend them to be Agricultural schools. The title of the bill was not his, and was not a happy one. A clerk was responsible for the title.

He reviewed the opposition made when the first bill was up. Then there was much talk against it as being class legislation; that the opposition talked of it more also as class legislation, legislation for farmers. The South called it sectional, hence he was emphatic that it was not intended for the especial benefit of Agriculture. Not intended for a class, in any part of the country.

"But he did wish, emphatically wish, that as many of them as possible be made where the teaching of the sciences should be the leading idea. He instanced the vast importance of this to the manufacturers, especially in New England. Business needed more science."

"He expected the schools to be schools of science rather than classical colleges; that the schools be, in fact, colleges and not institutions of lower grade, not mere academies or high schools. We asked upon this matter in considerable detail because there was much talk in some of the States about dividing the sum for lower grade schools.

He said that the bill was purposely and carefully planned so that the old colleges might use this as an aid in expanding in the direction to give them more science teaching or that new colleges might be organized as the conditions and needs in the several States might demand. There were classical colleges enough. More science was needed in every State.

But in all he wished as a prominent feature the 'useful sciences' be taught and that where the natural influences of the studies might have less tendency to draw the students into purely literary and professional pursuits and away from business pursuits."

The Sheffield Scientific School had on the advice of the Secretary of War and General Sherman undertaken to teach the science of war and had employed a Prussian officer, who had commanded volunteers in our Civil War, to give lectures
Mr. Morrill
on this subject. He "thought that at least one college in every State should teach military science."

"The old classical colleges did not now have science enough. They could not or would not teach what the business men wanted. This bill was intended to help this higher branch of education, not to introduce or aid or meddle with the common schools, or the academies and high schools, nor with the 'classics'."

Referring to the proposition to use the land-grant fund to establish schools of secondary grade, he said that it should be used for colleges. When asked "if the State could establish any notable professorships in the various colleges from this fund simply as professors of technology in the college," he said emphatically, "No." "In that case it would not be a school in which the leading idea should be in the sciences most applicable for business use. I asked him if the whole could not be used in enlarging an existing agricultural college. He said it might be used in an agricultural college, but that was not broad enough alone to devote all the fund to that special business. He thought the use of the fund should be to a school where the leading idea should be the teaching of science and not the subordinate idea".

"The matter of the grade of instruction was much discussed and in various lights. He was emphatic in that it was for higher education, not such instruction as was furnished by academies, high schools and fitting schools or other grades between the common schools and the college. Such studies could and undoubtedly would be furnished by many colleges, but such would be provided by the State and not from the National Grant."

"As to the farms, they might or might not be attached. He did not consider them essential or he would have made it a condition as he had the condition of the teaching of the sciences. But he assumed that many, perhaps most, of the institutions would find a farm desirable. He himself thought it was a desirable aid in agricultural instruction but he would not make it imperative. He had in his mind to aid science instruction, scientific schools, education for business pursuits. He praised our plan highly (the Sheffield Scientific School), and said over and over again it was working on a line he greatly commended, a line which complied with the letter, and the spirit, and the intent of the law,"

"I enquired again specifically about the manual labor question then so much discussed. He thought it might be well for physical exercise, thought many schools would adopt it, but he was not sure enough of its real value as an educational factor to make it compulsory, etc., etc., etc."

At the Massachusetts Agricultural College June 21, 1887, in connection with the celebration of the 25th anniversary of the passage of the Land-Grant Act, Mr. Morrill spoke as follows:

"The Land-Grant Colleges were founded on the idea that a higher and broader education should be placed in every State within the reach of those whose destiny assigned them to, or may have the courage to choose industrial vocations where the wealth of nations is produced; where advanced civilization unfolds its comforts and where a much larger number of its people need wider educational advantages and impatiently await their possession.

"The design was to open the door to a liberal education for this large class at a cheaper cost from being close at hand and to tempt them by offering not only sound literary instruction but something more applicable to the productive employments of life. It would be a mistake to suppose it was intended that every student should become either a farmer or a mechanic, when the design comprehended not only instruction for those who hold the plow or follow a trade, but such instruction as any person might need - with 'the world all before them where to choose' - and without the exclusion of those who might prefer to adhere to the classics. Milton in his famous discourse on education gives a definition of what an education ought to be, which would seem to very completely cover all that was proposed by the Land-Grant Colleges; and Milton lacked nothing of ancient learning, nor did he suffer his culture to hide his statement of republicanism. * * * It is a gratification to find that the largest endowment in any State has been husbanded most successfully, having fallen into very astute and worthy hands, and has served, with other large bounties, to build up the most complete and prosperous of these insitutions." (241.)

Speaking in behalf of the University of Vermont and State Agricultural College before the Vermont legislature at Montpelier in 1888, Mr. Morrill said:

"Only the interest from the land grant fund can be expended, and that must be expended, first - without excluding other scientific and classical studies - for teaching such branches of learning as are related to agriculture and the mechanic arts - the latter as absolutely as the former. Obviously not manual, but intellectual instruction was the paramount object. It was not provided that agricultural labor in the field should be practically taught, any more than that the mechanical trade of a carpenter or blacksmith should be taught. Secondly, it was a liberal education that was proposed. Classical studies were not to be excluded, and, therefore, must be included. The Act of 1862 proposed a system of broad education by colleges, not limited to a superficial and dwarfed training, such as might be had at an industrial school, not a mere manual training, such as might be supplied by a foreman of a workshop, or by a foreman of an experimental farm. If any would have only a school with equal scraps of labor and of instruction, or something other than a college, they would not obey the national law.

Whatever else might be done under the national law of 1862, scientific and classical studies, as already stated, were not to be excluded, were, therefore, to be preserved, and this is set forth at the very starting point, but the national bounty act brought to the front 'branches of learning related to agriculture and the mechanic arts' - learning in the broad fields of the practical sciences, and none are broader than those related to agriculture. The useful was to have greater prominence in the eyes of students, as it will have in all their after-life, and not stand unequal and shame-faced even in the presence of ancient literature. Military tactics were also to be included, not merely as a healthful physical exercise, but as a valuable, incidental acquirement for all young men, with patriotic blood in their veins, and upon whom our country must rely as ever ready to stand among its future guardians and defenders.

The fundamental idea was to offer an opportunity in every State for a liberal and larger education to larger numbers, not merely to those destined to sedentary professions, but to those much needing higher instruction for the world's business, for the industrial pursuits and professions of life." (492)

There has been much discussion even down to recent times as to whether "mechanic arts" as used in this act meant engineering, trade education or mechanic arts as applied to agriculture only. President R. A. Pearson of the Iowa State College summed up this matter very well in a paper read at the annual meeting of the Association of American Agricultural Colleges and Experiment Stations in 1915. He points out that in the dictionaries in use when the land-grant bill was being considered "mechanic arts" is a broader term than engineering or trades.

"The Encyclopedia Britannica of 1857 states that mechanics, applicate or applied, is a term which, strictly speaking, includes all applications of the principles of abstract mechanics to human art. The article continues 'thus have theory and practice in all ages promoted each other's advance; and the greatest obstacle to the advancement of both has always been a popular and scholastic fallacy that they are inconsistent.' Happily that fallacy is now disappearing and its occurrence in the writings of any author may be considered as a mark either of ignorance or of the inconsiderate use of words." (90)

In the Federal Acts of 1883, 1890, and 1907 Congress had not indicated any objection to the high-grade work in mechanic arts or engineering being done by the land-grant colleges. Immediately after the passage of the Land-Grant Act of 1862 plans were made for giving the highest grade of instruction in mechanic arts at the Massachusetts Institute of Technology, Cornell University and other land-grant institutions.

The Bureau of Education reported that

"The first want felt in the establishment of this class of schools was the education of men of science to man them, but the first purpose for which they were established was the instruction of able, educated, trustworthy technologists, such as well informed engineers, architects, mechanics, manufacturers, miners, agriculturists, and the like, for which the country was at that time loudly calling." (90)

It has sometimes been contended that "mechanic arts" in the land-grant act was a wholly incidental matter and that only mechanic arts in their relation to agriculture was intended. This view is evidently refuted by Mr. Morrill's statement about the Act. Moreover the movement which culminated in the plans for the People's College in New York and industrial universities in Illinois had included instruction in Mechanic Arts as well as agriculture. The Agricultural Societies and other friends of agricultural education had often included instruction in mechanic arts in their programs. Mr. Morrill was therefore in line with the progressive educational thought of the times when he put mechanic arts on the same plane as agriculture in his land-grant bill. Many of the States immediately undertook the establishment of Agricultural and Mechanical Colleges or introduced both branches in their universities.

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From the language of the land-grant act, from the statements of Mr. Morrill regarding the purposes of this act and from the history of the educational movements in this country preceding the introduction of the Morrill Bill of 1857 it seems a reasonable supposition that the intention was to provide funds for broad institutions in which the classics, sciences and practical studies in agriculture and mechanic arts would be combined in order that the industrial classes might have a better opportunity for a liberal and practical education. Some of the students in these institutions were to be trained for agricultural and industrial pursuits but others would there make preparation to enter the professions. Undoubtedly it was expected that agriculture and the farming people would receive great benefits from these institutions, which were intended to advance knowledge by experimental inquiries, as well as to teach improved methods of agriculture. At that time the great majority of people in the United States, and particularly in the South and outside of a few Eastern cities were living on farms. To secure the votes of Southern and Western Members of Congress it was necessary to lay great stress on the benefits of the bill to agriculture and not to give the impression that this measure was for general education. With Congress in a highly sensitive state of mind regarding anything which might excite a discussion of States rights it was wise not to prolong debate on this measure. Therefore there was avoidance of detailed statements regarding the purposes of the Act and the kinds of institutions it was intended to foster. The matter was settled largely by the personal solicitation of the votes of Members of Congress by Morrill and the men associated with him in working for the passage of his bill. Apparently definite pledges to vote for the bill were secured and the votes showed a small but firmly held majority in its favor.

It was inevitable that a measure so broadly formulated and so indefinitely discussed before its passage should be interpreted in different ways and according to the educational conditions in the several States. In Michigan it was natural to

give the land-grant to an agricultural college, in Massachusetts to divide the grant between institutions for agriculture and mechanic arts, in Connecticut and some other States to give it to a scientific institution in which along with other sciences the science of agriculture would be taught to a few students, in Southern and some Western States to provide for literary and scientific education, with a little agricultural instruction, and in New York, Illinois, Wisconsin, and other States to create departments of agriculture and mechanic arts in universities. In many of the States there were few secondary schools and these were not generally accessible to the farming people. The land-grant colleges were therefore compelled to establish preparatory classes and to make their entrance requirements quite liberal. Trained teachers of the natural sciences were comparatively few and in the colleges generally it was expected that they would teach more than one science. There were practically no trained teachers of agriculture. This subject must be taught by the science teachers or by farmers with sufficient general education to prepare lectures and with enough farm experience to give direction to the farm labor of the students. Most agricultural books were of foreign origin or filled with material from foreign sources. There was no body of tested knowledge derived from American experience. Agricultural instruction was largely given through lectures, which were often very theoretical or confined to the personal experience of the author. In a large part of the country pioneer conditions prevailed in farming, land was abundant and cheap, and production outran demand. In these regions there was little incentive to study agriculture in a college. State control of higher education was a new thing. Politicians were naturally inclined to take a hand in the management of the land-grant colleges and in the absence of a civil service system appointments of college presidents and faculties were not always based on merit. Frequent changes in boards of control and faculties made these colleges unstable in administrative policies and curricula.

Under such conditions it is not surprising that after the first enthusiasm aroused by the land-grant and the novel organization of these colleges had subsided that they grew slowly or even declined in the number of their students. At the end of five years after the passage of the bill only 9 States had land-grant colleges in operation. At the end of 10 years 21 other States had organized land-grant colleges, but in 6 States these colleges had been open for students only 1 or 2 years.

The statistics of the first decade are very imperfect but it appears that in 1872-73 twelve of these colleges had less than 200 students in all their branches, 6 had less than 300, 4 less than 400, and 4 over 400. In their agricultural and mechanical departments 12 had less than 50 students, 6 less than 100, 6 less than 150 and only 3 over 150.

Acceptance of the College Land-Grant by the States.

Under the Act of July 2, 1862, the States were required to express acceptance of this provision within 2 years but by the Acts of April 14, 1864 and July 23, 1866, this time was extended to July 23, 1871, and as each Territory was admitted to statehood provision was made in its enabling act for a grant of land for agricultural and mechanical colleges in lieu of the original grant of 1862.

Iowa accepted the provisions of the Morrill land-grant Act on September 11, 1862 and was followed by Vermont on October 29 and Connecticut on December 24 of that year. Fourteen States accepted it in 1863, 2 in 1864, 1 in 1865, 6 in 1866, 4 in 1867, 3 in 1868, 1 in 1869, 2 in 1870, making 36 in 9 years. During that period 35 institutions received its benefits by action of the State legislatures; 15 were colleges and 20 were universities at that time or later developed into universities. In Connecticut, Mississippi, North Carolina, South Carolina, and Rhode Island the use of the land-grant funds was finally taken away from the university and given to a separate college. In Delaware, Florida, Maine, Maryland, New Hampshire and Ohio colleges were first given the land-grant and afterwards

became universities. In 9 States the land-grant was given to 2 colleges and 7 universities wholly or partly on a private foundation and in 10 States to publicly supported colleges, which had more than an agricultural curriculum and were often designated agricultural and mechanical colleges. Massachusetts divided the fund between the Massachusetts Agricultural College and the Massachusetts Institute of Technology.

Between 1866 and 1910 twelve States received land-grants under their State enabling acts or other acts in lieu of the grants under the original Act. In Colorado, Utah, Montana, Washington, South Dakota, North Dakota, Oklahoma and New Mexico separate colleges were established and in Nebraska, Wyoming, Idaho and Arizona the benefits of the land-grant were given to the State University.

Colleges for negroes in Virginia, Mississippi and South Carolina received a portion of the land-grant fund.

Use of the College Land-Scrip by the States

Many of the States, particularly in the East and South, put the land-scrip on the market so rapidly that they received much less for their land than the standard Government price of \$1.25 an acre. They thus established so small funds that the annual interest was not sufficient for the maintenance of a college. The Central and Western States were more careful in locating and managing their land.

As regards the investment and use of the funds derived from these land-grants it proved impracticable to carry out the exact letter of the law. In 1918 the Bureau of Education stated that there was scarcely one State which had not, in some way, at some time, been in default.

"The principal lines of default have been a delay in investing the capital, or investment at less than 5 per cent, causing loss of income to the colleges; use of capital for other purposes than for the college; and finally the use of income for purposes not authorized by law, such as for the administration of lands or expenses of investments. In general these defaults have been made good as soon as proper attention was directed to them.

Although defaults have been corrected, in the main immediately on being recognized, yet seldom have deficits been refunded or made up. Especially in the matter of loss of interest from lack of investment or from deficient interest return, it has been usual to replace the investment so as to obtain the required 5 per cent but to allow past losses to remain unsatisfied. There are, however, several exceptions to this practice." (2)

In the States which received scrip or land under the original act several plans for obtaining the required 5% have been adopted.

"(1) In a large number of the States, when it became evident that a continuous 5 per cent investment would be difficult to find, the fund was turned over to the State treasury and the State itself assumed the load of interest, the capital being considered as part of the irreducible State debt. This was done in Connecticut, Delaware, Georgia, Indiana, Kentucky, Louisiana, Maine, Massachusetts, New Hampshire, New Jersey, New York, and Pennsylvania.

(2) In other States the receipts from the sale of lands were turned in to the State treasury as fast as received and added either to the State sinking fund or to general State funds, no attempt at outside investment being made. In such cases the State issues certificates of indebtedness at a good rate of interest. Michigan, Missouri, and Ohio handled their funds in this way.

(3) Other States have invested the funds at the best rate obtainable in the open market, and make up the difference between the rate obtained and the required 5 per cent by direct legislative appropriation. Maryland and Rhode Island handle the funds in this way.

(4) In Florida, Minnesota, and Wisconsin the legislature has authorized the governing board of the college to transfer funds from other general college funds in order to make up the deficit in interest.

(5) In Illinois, North Carolina, and South Carolina the fund has been lost by defalcation or dishonesty and has been restored by the legislature. A State bond for the amount has been issued in each of these States."

"The newer States received invariably, in their State enabling acts, grants of public lands for many different purposes and running into the millions of acres. The care of these lands has become one of the principal administrative duties of the State. In every case a State land board has been created which locates the lands under the different grants and arranges for their use either by sale to individuals who will develop them, or by rental of the lands or of the privileges, such as grazing, mining, lumbering, water power, etc. Sales of lands are usually made on a part cash basis, the State collecting a liberal rate of interest on the deferred payments.

The amount received from actual sales of lands of the agricultural college grants is turned over to the State treasurer and invested either by him or by some other authorized agency, at the best rate obtainable."

Lands and Scrip

"Twenty-eight States were allotted 8,160,000 acres of land in scrip; 20 received 2,890,000 acres in place, giving a total allotment of 11,050,000 acres under the act of July 2, 1862, or supplementary acts in lieu of it. Of this total, considering the grants to the newer States as already located, 10,929,215 acres actually passed to the States, the reduction of 120,785 acres being due to fractional deductions in issue of scrip, to the location of double minimum value lands, and to the failure of some States to locate the full allotment.

In 1914 there were 1,209,837 acres unsold, part of which were leased; and 51,850 acres unlocated, not including New Mexico with 150,000 acres and Oklahoma with 250,000 acres, none of which were located.

Capital of the Fund.

"The scrip and lands have been sold for \$12,643,309.43, of which \$119,164.90 was used in four States to purchase land. The remaining capital has increased during 52 years of existence (1862 to 1914) until it amounts to \$13,621,712.07. Of this amount \$2,205,489.08, in 10 States, draws interest at less than 5 per cent, but only 4 States fail to make up the deficit in some way.

Income

"The total income under the 1862 land-grant endowment act from all sources, not including additions to principal, for the year 1913-14 was \$856,313.95, of which \$725,496.32 came from interest on invested funds, \$71,258.05 from interest on deferred payments of land purchases, \$55,884.83 from leased lands, from privileges, and from miscellaneous sources, and \$4,877.76 from direct appropriations to make up the difference in interest from investments at less than 5 per cent." (2)

In 1923 the Bureau of Education reported that the total number of acres actually received by the States was 10,928,295, of which 939,800.58 acres with an estimated value of \$13,592,749.21 were not yet sold. The fund accumulated from the sale of lands aggregated \$17,418,096.03. The largest fund in a State was \$1,569,406.50 in North Dakota; Michigan had \$1,003,495.12. Twelve other States had from \$500,000 to over \$700,000. Rhode Island had \$50,000. Arizona had sold only a small portion of her grant for \$3,855.91.

The First Decade of the Land-Grant Colleges 1862-1872.

Conditions Affecting the Early Status of these Colleges.

When the land-grant act of 1862 was passed the United States was in the midst of civil war to determine whether the States had a right to secede from the Union. The war had been brought on by the problems connected with negro slavery. The system of agriculture established in the South depended on the use of illiterate slaves to grow cotton with crude implements and on soils not requiring scientific management or fertilizers to produce a profitable crop. Cotton growing had therefore been rapidly spread over the fertile lands in the Southern Mississippi Valley and in Texas between 1840 and 1860. When the Northern States persisted in refusing to extend slavery into the regions further West and moreover

increasingly favored the abolition of slavery throughout the Union the Southern cotton-growing States became so alarmed that they decided to test their right to secede and took with them some States outside the Cotton-belt whose economic interests and other relationships were inextricably bound up with the slave system.

Though hard pressed by the war the Northern States felt that whatever its issue it was vitally important for them to control and develop the great empire between the Mississippi River and the Pacific Ocean, which was then in the beginnings of its development.

Congress therefore gave much attention to matters connected with the disposal of the public lands and their settlement. The Homestead Act became a law May 20, 1862. A similar measure had been vetoed by President Buchanan in 1860. This bill charged the settler \$0.25 an acre for his land but the desire to induce rapid settlement was now so great that this charge was omitted from the Act of 1862. 65,000,000 acres were granted to settlers under this act up to 1880. Grants of land to railroads were continued and greatly increased. While the grants to States and corporations for internal improvements between 1841 and 1860 had aggregated 30,000,000 acres, those to railroads alone between 1850 and 1871 amounted to 159,000,000 acres, in addition to 55,000,000 acres given them by the States.

The war greatly stimulated manufacturing. The variety and extent of manufacturing in the United States had greatly grown in the decade prior to the Civil War. In 1860 the value of manufactures aggregated nearly 2 billion dollars and was almost equal to the value of agricultural products. The war and the westward movement of population to engage in farming, the building of railroads, and the development of villages and cities caused a greatly increased demand for manufactures, which more than overbalanced the loss of Southern trade.

From 1860 the United States increasingly became the chief source of food products and raw materials for Europe. The war greatly stimulated agricultural production. Scarcity of labor on the farms induced the use of more machinery, horses and mules. Already before the war reapers, mowers, horse-rakes, cultivators, horse-hoes, seed-drills and other improved machines had come into quite common use. Thereafter the variety and number of farm machines in actual use constantly increased. It has been estimated that in 1865 there were 250,000 reapers, each of which cut 10 acres per day of 12 hours. Within the half century ending in 1880 the average amount of grain harvested, threshed and prepared for market per man per day increased from 4 to 50 bushels. As soon as the war was over many of the 1,000,000 men who were in the Union Army, together with large numbers of Confederate soldiers, went to swell the huge hosts of natives and immigrants who were settling on western lands. The population of the grain States increased over 42 per cent between 1860 and 1870 and with the rapid building of railroads during the next decade over 297,000 square miles, an area equal to Great Britain and France, were added to the cultivated land of the United States. From about 1870 the manufacture of new process flour made possible a great expansion of the area devoted to spring wheat. Improvements in transporting and handling grain, general reduction of freight rates, as compared with those prior to the coming of the railroads, and the use of elevators, also characterized this period.

To the South the war brought disaster and impoverishment. A blockade largely prevented the exportation of cotton and tobacco. The abolition of slavery wiped out the vast values represented by human chattels. Farm equipment was largely ruined. Great numbers of the white men who would have been owners or managers of farms lost their lives in the war. At first an attempt was made to continue the old plantation system and this was helped by the high price of cotton. But over production materially reduced the price, the negroes were

unaccustomed to a wage system and would not work continuously or efficiently, debts incurred in reestablishing the plantations could not be paid, excessive taxation by the carpet bag governments made the planters' condition more hopeless. Many planters were forced to go out of business and great tracts of land became idle. It is estimated that the money value of Southern farms declined 48% between 1860 and 1870.

Much land was then purchased in small tracts by white men and some by negroes. The latter however, were generally content to become tenants and work little farms for a share of the crop. By 1876 about 40 per cent of the men working on Southern farms were whites as compared with 11 per cent before the war. More fertilizers and somewhat better machinery were used and the yield of cotton per acre increased from 172 pounds in 1860 to 222 pounds in 1870. There was also some diversification but food supplies largely came once more from northern farms. A credit system was established which has ever since kept multitudes of the small farmers, especially the negroes, in financial bondage.

In the Northeast dairy farming, poultry raising, fruit growing and market gardening were largely developed. During the war the farmers in that region who kept on their farms were generally prosperous but many went into the army or into other industries and many joined the hosts of emigrants to the western lands. There was a general reduction in the value of farm lands in that region and much of the poorer land went into pastures or wood lands. The growing of great numbers of cattle and sheep on the vast free ranges of the West largely restricted animal husbandry on the farms to the raising of hogs, which were used as a means of disposing of a large share of the corn crop. In general American farming after the Civil War became chiefly a matter of raising a limited number of staple crops. West of the Alleghanies these were principally raised on soils which required no fertilizers.

Prior to the Civil War while gold and silver money was issued under Federal control paper money was issued by banks under State laws. The great increase of the mining of the precious metals after the discovery of gold in California in 1848 materially enlarged the volume of metallic currency. The growth ^{of} and manufactures and commerce and the spread of population westward caused the rapid creation of banks, many of which were on an unstable and speculative basis. By 1860 there were more than 1500 State banks, which issued some 7000 varieties of bank notes. Merchants, farmers and people generally had much difficulty in determining which issues represented real values. Counterfeit and spurious issues also made much trouble. After the outbreak of the war gold and silver money went out of circulation. The Government issued greenbacks and there was great inflation of the currency, with resulting high prices. The national banking system established in 1863 brought the issuing of paper money by the State banks to an end but the circulation of bank notes by the national banks did not proceed rapidly. The attempt of the Federal Government to contract the currency, beginning with 1866, was one of the causes contributing to the severe panic of 1873. The unsatisfactory condition of the currency, together with the high and often excessive rates of interest on farm mortgages, was a source of much trouble and dissatisfaction among the farmers and led to the formation of the Greenback Party in 1876.

With the rapid spread of population during the decade succeeding the passage of the land-grant college act production of crops outran demand, particularly where the means of transportation were limited. Building of railroads had gone on actively before this time and by 1860 they had largely supplanted the use of canals and carried about two-thirds of the internal trade. Chicago had been connected with New York City by rail, in 1853. The following year a railroad had been built to the Mississippi River and in 1858 to the Missouri River. After the war short lines were built in all directions and the construc-

tion of transcontinental lines was undertaken. For a number of years the farmers enthusiastically supported the building of railroads, gave of their own means and voted for the use of public funds for this purpose. The general result greatly benefitted the farming communities. Speculative features connected with the construction and management of the railroads, unjust and discriminating rates imposed on many communities and other evils growing out of uncontrolled use of funds and authority by more or less unscrupulous railroad managers caused much trouble and led to great ~~te-great~~ dissatisfaction among the farmers, which finally resulted in a mass movement to curb the power of the railroad corporations.

The railroads contributed very greatly to the rapid spread of population and together with other economic and social conditions kept both the old and new communities in a constant state of flux. Great numbers of the more vigorous and adventurous native people of the East went into the new communities and their place was more than taken by the hordes of emigrants from Northern Europe. Many of the more enterprising and financially able of the Eastern people settled where comparatively well organized communities already existed and built up villages and cities with the complicated financial, industrial, and social elements of modern civilization. This caused an exodus of the poorer but active people who had occupied this territory and they renewed their efforts to establish agriculture and rural communities further West. There they found the pioneer settlers who had already demonstrated the agricultural value of the land but had not the means to develop it fully and being of a restless nature were willing to sell out and resume their pioneering still further West. Thus there was constant agitation and movement from East to West and men and women were principally engrossed in seeking new avenues for their activities and making a livelihood or fortune by comparatively superficial means.

In agriculture, in particular, there was little incentive to thorough and painstaking work. If the farm one owned was not satisfactory the family could

easily get another where with comparatively rough and ready methods abundant crops could be produced and where perchance there was a better opportunity for enlarged farming operations and better provision for the family's future. Or if one were a farm laborer he might at least become a homesteader and in a few years owner of 160 good acres as a result of quite simple farming.

As regards education, outside of New England the question of complete support of even elementary schools with public funds had been settled in the Northern States only a few years before the Civil War. In New York while a system of free schools was provided by law in 1849 this was much opposed and actually abolished for a time. In Pennsylvania the maintenance of free schools was optional until 1854. In Ohio, Illinois and Iowa the schools were made wholly free between 1853 and 1858. In Kansas nearly all schools were private prior to 1859 and in Michigan free schools were not generally established until 1869. When the college land-grant act was passed and in many places in the North long thereafter the terms of free public schools in rural communities very often covered only a few weeks. The three R's, with perhaps a little geography and United States history, were imperfectly taught in the great majority of these rural schools.

In the South anything like a general State public school system did not exist before 1870. ~~That year there were only about 160 public high schools in the United States.~~ Before the Civil War it was a crime to teach negroes even to read and write and such free schools as existed were principally charity institutions. After the war the South had the burden of providing separate schools for the two races and it took considerable time to overcome the traditional prejudice against the use of public funds to maintain any kind of schools.

The maintenance of secondary schools with public funds in 1860 was practically confined to the larger cities. Statistics compiled by Dr. Dexter of the University of Illinois show that in the cities of 25,000 population and over in 1859 there were 53 high schools, of which 32 were in the North Atlantic

States, 17 in the North Central States, 3 in the South Central States and 1 in
(39)
the Western States. Dr. Harris, United States Commissioner of Education, stated
that in 1870 there were about 160 public high schools in the United States,
whereas ten years later there were nearly 800, and in 1890 there were 2526.
Progress in their establishment was most rapid in the North Central States which
in 1890 had 1376. The high schools were supplemented by academies or other private
schools, many of which were maintained by religious denominations.

In the earlier years of the land-grant colleges public high schools
were rarely accessible to farmers' children and the expense of tuition and
board in the private schools prevented the attendance of such children in any
large numbers. It was, therefore, necessary for these colleges in most of the
States to provide preparatory classes if they were to have any considerable num-
ber of students.

When the Michigan Agricultural College was opened in 1857 there were
about 200 colleges in the United States. In most of them the classical course
leading to the degree of bachelor of arts was the only regular collegiate course.
Chemistry, physics, botany, zoology, geology and astronomy were often included
in this course but usually taught with lectures and textbooks, without laboratory
practice by the students. Latin and Greek were the principal entrance requirements,
to which were usually added English grammar, geography, arithmetic, algebra (through
simple equations) and sometimes history. Yale was the first college to require geome-
try and this was done in 1856.

The Rensselaer Institute, founded in 1824, had been reorganized in 1849
as the Rensselaer Polytechnic Institute for "the education of architects and civil,
(414)
mining and topographical engineers". In 1858 this institution had a faculty of 14,
including professors of geology, chemistry and natural history. There were 99 students,
of whom 20 were in a preparatory class. The Chandler School of Science had been estab-
lished at Dartmouth College in 1851 and in 1853 a technological course was begun at the
University of Michigan.

According to the catalogue for 1857 the faculty of Harvard University consisted of 51 persons, including Louis Agassiz, professor of zoology and geology, Asa Gray, professor of natural history, Josiah P. Cooke, professor of chemistry and mineralogy, Charles W. Eliot, assistant professor of mathematics and chemistry, E. N. Horsford, professor and lecturer on the application of the sciences to the useful arts, J. Wyman, professor of anatomy, Joseph Lovering, professor of mathematics and natural philosophy, and Benjamin Pierce, professor of astronomy and mathematics. In the regular undergraduate course in Harvard College chemistry and botany were required in sophomore year, and physics in junior and senior years. Botany was an elective in junior year and geology, anatomy and zoology in senior year. There were 398 undergraduates and 4 graduate students; in the divinity, law and medical schools there were 231 students.

In the Lawrence Scientific School of Harvard University there were only 67 students. "Candidates for admission must have attained the age of 18 years, have received a good English education and be qualified to pursue to advantage the courses of study to which they propose to give their attention." "The degree of Bachelor of Science may be conferred on any student, who, having attended the instruction of the School for at least one year, and completed the prescribed course of study in one or more departments, shall have passed a satisfactory public examination." There were 17 students in chemistry, 6 in geology and zoology, 8 in comparative anatomy and physiology, 1 in botany and 1 in mineralogy and geology.

Professor Horsford gave a course in "experimental chemistry and research", including among other things analyses of soils and ashes, and manufacture of manures. "In addition to the practical instruction in chemistry as an art, in which each student is necessarily a class by himself, there is a systematic daily exercise, on the blackboard, in the solution and explanation of chemical problems."

In zoology and geology, besides the lectures, Professor Agassiz "will afford students access to his laboratory during certain hours, in order to show them how to observe different formations and how to conduct a regular geological survey." Excursions in term-time and vacation are also offered.

According to the catalogue for 1887 the Faculty of Natural History comprised

of Natural History, Joseph P. Moore, Professor of Chemistry and Mineralogy,

and Professor of the application of the sciences to the useful arts, J. W. W. W.

Joseph P. Moore, Professor of Chemistry and Mineralogy, and Natural History,

and Professor of Natural History, Chemistry and Mineralogy, J. W. W. W.

and Professor of Natural History, Chemistry and Mineralogy, J. W. W. W.

and Professor of Natural History, Chemistry and Mineralogy, J. W. W. W.

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and Professor of Natural History, Chemistry and Mineralogy, J. W. W. W.

In botany Professor Gray will give "special practical instruction" "in classes of not more than 3 each", from April 1 to the close of the term. The botanic garden is accessible to students.

In Yale College in 1857 the faculty consisted of 41 persons, including Benjamin Silliman, emeritus professor of chemistry, mineralogy and geology, D. Olmstead, professor of natural philosophy and astronomy, C. Hooker, professor of anatomy and physiology, J. D. Dana, professor of natural history, Benjamin Silliman, Jr., professor of general and applied chemistry, J. A. Porter, professor of organic chemistry, S. W. Johnson, professor of agricultural and analytical chemistry, and E. H. Twining, assistant in analytical chemistry. In the regular undergraduate course there were 447 students and in theology, law and medicine 82 students. In the Bachelor of Arts course there were only six electives, of which mineralogy was one (for a single term - 1/3 year). Among the required subjects were natural philosophy and astronomy in junior and senior years, one term of chemistry, and short courses of lectures in mineralogy, geology, meteorology and anatomy. The Yale (Sheffield) Scientific School had only 36 students, of whom 13 were in chemistry. "The whole course occupied two years." Previous study of chemistry was not required for admission to the school. "The analytical laboratory is fully equipped with means of practical instruction in all branches of analytical and experimental chemistry."

The atmosphere of even Harvard, Yale and the University of Michigan, where the study of the sciences was much more encouraged than at the other colleges, was so charged with the traditional influences of the classical learning that few students could be persuaded to take the scientific course which had practical applications. The land-grant colleges were therefore entering on what was practically an uncultivated field of education in this country. Their subject-matter, curricula, and methods of instruction had to be developed to suit new conditions. On the one hand they felt obliged to keep close to their agricultural and mechanical constituency,

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particularly the farmers, and therefore to make the requirements for admission comparatively low. On the other hand they felt the influence of the college standards then in vogue, particularly since their administrative officers and faculties were necessarily drawn from the ranks of men trained in the classical courses or in the pure sciences. In agriculture there was very little knowledge which had been tested scientifically. The instruction therefore necessarily dealt almost entirely with practical details of farm operations or with theories resting on shallow and often unsound bases.

To satisfy the demand for practical instruction these new colleges fell back on the manual labor theory and practice, which fortunately for them still had some standing among educators. It is almost safe to say that it was the manual labor feature of many of the early agricultural colleges which made it possible for them to exist and to draw considerable numbers of students from the farming people. Where this was omitted or minimized the agricultural students were very few. This manual labor system was bound to fail because it had little educational value. It served, however, to give the agricultural colleges under the land-grant act time to get organized and fairly well settled in their general educational program and to begin through experimental inquiries to collect the tested knowledge necessary to the construction of worthwhile agricultural courses.

Organization and Early Work of the Land-Grant Colleges.

When the land-grant act passed there were in operation agricultural colleges in Maryland, Michigan and Pennsylvania, and agriculture was taught at the Yale Scientific School in Connecticut. Within the next ten years agricultural instruction was given in agricultural and mechanical colleges in Alabama, Arkansas, Delaware, Iowa, Kansas, Maine, Maryland, New Hampshire, New Jersey, Texas, Virginia, and in universities in California, Georgia, Illinois, Kentucky, Minnesota, Mississippi, Missouri, Nebraska, New York, North Carolina, South Carolina, Tennessee, Vermont, West Virginia and Wisconsin. In Massachusetts a college devoted to agriculture only had been established and a separate institution for the mechanic arts.

The influence of the Yale Scientific School was strongly felt in the organization of the land-grant institutions in a number of States. In New Hampshire the land-grant college was attached to Dartmouth College, where the Chandler Scientific School had been organized on the basis of an endowment by Abiel Chandler for mechanic arts and civil engineering. This was supplemented by a gift from General Sylvanus Thayer for architecture and civil engineering. A course in applied science was offered. Work under the land-grant act was begun in September, 1868. With the aid of the land-grant fund professors of agricultural chemistry and animal and vegetable physiology were employed.

In Rhode Island the land-grant fund was given to Brown University, which organized a scientific curriculum of three years, including a brief course of lectures on agriculture.

At the University of Vermont in 1867 instruction in analytical and agricultural chemistry was offered in the scientific department, which had a three-year curriculum, including a course of lectures on agriculture in February and March. In New Jersey a scientific school was opened at Rutgers College in 1866, which had a farm of 100 acres for experimental purposes.

In 1867 agricultural and mechanical colleges were opened at Orono, Maine, with 3 students; at Morgantown, West Virginia, with preparatory and scientific and agricultural departments.

That year the University of Wisconsin announced that a student may give three years to agriculture or may join the College of Letters or Arts and devote as much time as he pleases to agriculture and in 1868 it appeared that the student well up in science could complete the agricultural course in one year.

The Maryland Agricultural College had a scientific course in 1867 with perhaps some instruction relating to agriculture. The Kansas Agricultural College which had opened in 1863 five years later had an academic or classical curriculum and an agricultural and scientific curriculum of three years. Many of the students were in prepara-

tory classes. Special efforts were made to train teachers. The student body contained 97 men and 71 women.

In New York Cornell University was opened in 1868, with a College of Agriculture, and professors of agricultural chemistry and veterinary medicine. Prior to 1873 it had great difficulty in securing a satisfactory teacher of agriculture, and the number of students in the strictly agricultural classes was small.

The Massachusetts Agricultural College, the only land-grant institution intended to be exclusively for students interested in agriculture and agricultural science, was opened in 1867 and the following year had 96 students.

Five years later, at the end of the first decade after the passage of the land-grant act, there were reported to be in agricultural and mechanical courses in Michigan 143 students; in Pennsylvania 130; in Maryland 130; in Maine 103; in New Hampshire 22; in Vermont 21; in New Jersey 67; in New York 151; in Rhode Island 25. In agriculture alone West Virginia had 29; Massachusetts 139; Kansas 50. In Wisconsin 30 students in the College of Arts attended lectures on agriculture.

In the land-grant institutions opened after 1867 there were students in agriculture and mechanic arts as follows: In Alabama 53; Georgia 151; Kentucky 181; Mississippi 5; Oregon 50; Tennessee 37; Virginia 122. In agricultural courses there were in Arkansas 50; Delaware 14; North Georgia 25; Illinois 87; Iowa 243; Missouri 138; Ohio 176.

In Pennsylvania the death of Dr. Pugh in 1864 was a very severe blow to the college. It had many internal difficulties and in 1868 there was an entire change of faculty. The college tended to become an institution for scientific and literary education and its name was changed to Pennsylvania State College in 1874.

In Connecticut the agricultural work was only a small part of the curriculum of a scientific school. There was instruction of a comparatively high order in analytical and agricultural chemistry, with laboratory practice. Beyond that

there were brief courses of lectures on agricultural subjects. The institution had no farm and the course was too severely scientific to attract many students. In 1868 the school stated its aims regarding agriculture as follows: "We cannot expect to equal the special schools of agriculture in the very desirable work of training practical farmers, though we hope by the prosecution of the science of agriculture, and by the training of scientific professors and agriculturists, to contribute to the progress of agriculture."

In 1871 a meeting of representatives of the agricultural colleges was held at Chicago. ^(p. 533) In a letter to Dean Davenport of Illinois, Professor E. W. Hilgard, who was present at that meeting, writes about one of the principal subjects discussed there, as follows:

"It followed the meeting of the American Association for the Advancement of Science, from where a number of men, including myself, went to Chicago as the result of a call issued some time before by a committee of agricultural college men, to discuss the question of agricultural education, which at that time already had begun to be sharply contested between the advocates of the 'Michigan plan', also followed by Pennsylvania, and those who, with the Sheffield School, Harvard and a few others, favored the university grade of agricultural education. I, after a few years' trial of the Michigan plan at the University of Mississippi (which I then represented), contended strongly for the second, with the corollary that in order to interest the farmers, experimental work bearing directly upon each State's practical problems, is the prime need. We had quite a lively time, Michigan battling strongly for the student-labor plan, as the only 'practical' one, and which would not 'educate the students away from the farm.' Gilman, then librarian of Yale, and I were the chief fighters on the University side, seconded in a measure by Gregory (president of Illinois University) and the delegates from Wisconsin and Minnesota."

During the first decade after the passage of the college land-grant act the States had accepted the provisions of the act, had sold their land-scrip so rapidly that the price of the land had been depressed with the result that in most States relatively small land-grant funds had been acquired and it was necessary for the States to supplement these materially if State colleges of the character contemplated in the land-grant act were to be maintained; the colleges to receive the benefits of this act had been selected and put or continued

in operation, but financial, economic and educational conditions had been such that only a limited number of students had been attracted to these institutions. The Civil War, in which many men of college age were engaged as soldiers, also hindered the early development of the land-grant colleges. It had proved particularly difficult to construct good agricultural courses. The teaching of chemistry, botany and zoology and their relations to agriculture and of practical systems of agriculture, principally by means of lectures, had been combined with manual labor on the college farms, which for the most part had had comparatively little educational value. The development of laboratory work in the natural sciences in which the students participated and the direction of the study of the sciences toward their applications to agriculture and other useful arts had thus far been the chief educational contribution of the land-grant colleges. The need of experimental inquiries to develop a body of scientifically tested knowledge which might be used as a basis for more thorough and satisfactory instruction in agriculture was beginning to be apparent. Neither the managers and teachers in the land-grant colleges, nor the farmers were satisfied with their agricultural work. Economic conditions were developing which would turn the efforts of the land-grant colleges largely in the direction of the mechanic arts and keep the number of agricultural students at a relatively low level for a number of years pending the carrying on of agricultural experimentation on a broad scale and with large practical results.

These colleges were also about to show that while their systematic courses in agriculture were weak they could broadly aid agricultural progress by their contacts with large numbers of adult farmers in their societies and farmers' institutes and through the agricultural press.

Farmers' Institutes were first held at the Kansas Agricultural College in 1868, and by the Illinois Industrial University in 1870, the Iowa Agricultural College in 1871-72, and the University of Nebraska in 1873-74.

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The Experiment Station and Extension Movements in the Land-Grant Colleges,
1873-1887.

General Economic Conditions in this Period.

The great panic of 1873 was the culmination of a period of rapid expansion of agriculture, manufacturing, and railroad building. The capital of the country had too largely been locked up in speculative and legitimate enterprises which were giving little or no return. The efforts of the Federal Government to put money on a sound basis by contraction of the paper currency and the limitation of the coinage of silver brought about the difficulties which usually accompany deflation. The great fires in Boston and Chicago helped to make the financial situation unusually bad. The general result of the situation brought about by this panic was a great lowering of the prices of merchandise and agricultural products and of wages and salaries. There was an extensive redistribution of the wealth of the country and the reorganization of its business activities. A great contest arose regarding the use of silver and paper money as related to gold. It was decided to continue the coining of the silver dollar, giving it a weight of $412\frac{1}{2}$ grains, but the amount of such coinage was definitely limited. The greenbacks were retained but not increased and on January 1, 1879, specie payment was resumed. Protection of manufacturers through a tariff became a settled policy, under which the home market was very largely reserved for domestic goods. The growth in urban communities with greatly varied industries, the continuing expansion of agriculture and the reconstruction of the South provided a constantly enlarging home market. Mechanic arts grew in variety and extent, and the applications of science to such arts became more and more numerous. By 1880 the annual value of manufactures in the United States had risen to over \$5,000,000,000. There was also a great increase in the mining of coal, iron, silver, gold, petroleum, etc. Activity in railroad building was soon resumed after the panic of 1873. Between 1870 and 1880 the railroad mileage doubled and in the next ten years grew from 93,296 to 163,597 miles. The largest part of this development was in the central and western States. Communication

through the postal routes and telegraph lines was greatly extended and in 1876 the telephone came. To meet the needs of reviving industry, immigration was strongly encouraged. In 1879 the number of immigrants rose to 789,000 as compared with 460,000 in 1873. Combinations of capital in railroading and manufacturing increased greatly in number and extent and produced profound results in the industrial world. These combinations at first took the form of agreements between competitors to fix prices, limit output or divide territory or profit. Then came the more substantial and permanent combinations known as "trusts", beginning with the Standard Oil Company in 1882. When these were made illegal "holding companies" were devised. The growth of large trusts was promoted by alliances with natural monopolies, especially railroads. The giving of rebates on freight charges to large shippers became very prevalent. The railroads themselves broke down competition with each other to a considerable extent through "pooling".

The transfer of the mechanical industries to large factories or organizations like the railroads and the increase of their management through corporations vitally affected the relations of industrial workers with their employers. Labor came to be looked upon more generally merely as a commodity and its human relationships were too often ignored. After the civil war wages did not increase as rapidly as prices. This led to the formation of unions by the locomotive engineers, bricklayers, iron and steel workers and other laborers. In 1866 the National Labor Union was formed but this was soon wrecked through its political activities. Then came the Knights of Labor. Begun in 1869 it was for 10 years a secret society and open on that account to much misrepresentation and attack. Its aims were "to bring within the folds of organization every department of productive industry, making knowledge a standpoint for action, and industrial and moral worth, not wealth, the true standard of national greatness." It wished "to secure to the workers the full enjoyment of the wealth they create, sufficient leisure in which to develop their intellectual, moral, and social faculties, all of the benefits, recreation, and pleasures of association."

The accomplishment of many of its demands could only be brought about by legislative action, and it ultimately became entangled in politics. It was also unfavorably affected by disastrous strikes in 1877 and 1886. Its government was highly centralized and autocratic and this brought it into conflict with other labor organizations. Its greatest influence was exerted between 1880 and 1890. At one time it claimed a membership of over 700,000. When it declined its place was taken by the American Federation of Labor, distinctly a "confederation", in which each trade was organized separately and represented in the national body by its union. The Federation aimed to deal only with matters of general interest to the unions.

Agriculture went on expanding after 1873 in spite of economic difficulty. Free public land and cheap private land in the West lured great multitudes of men to seek their fortunes by farming on virgin soils and under the freedom of pioneer conditions. The area of cultivated land spread beyond the region of adequate rainfall. The successful example of farming under irrigation which the Mormons had demonstrated prior to the Civil War, stimulated attempts at irrigation elsewhere. Railroads and speculators widely advertised the advantages of irrigation. Between 1870 and 1880 a million acres were brought under irrigation ditches and then under the influence of the speculative boon the irrigated area was increased to 3,631,381 acres in 1889. The Desert Land Act of 1877 under which 640 acres was offered at \$1.25 an acre to the settler practicing irrigation proved of chief benefit to the irrigation companies and to sheep and cattle ranchers, whose business was growing enormously during this period. The rapid expansion of agriculture, while it gave employment to multitudes of men and made comparatively easy the passage from the status of farm laborer to that of farm owner, constantly tended toward over-production of crops and livestock. The railroad building which accompanied the agricultural expansion outran the limits of safe business and led to charges for transportation which often seemed unfair to the agricultural people. The necessary sale of farm products through commission merchants who were often far away and had few personal contacts with the farmers created suspicions of unfair dealing which were

in many cases justified. Federal taxation which produced more revenue than the Government needed for ordinary expenses and State and local taxation to provide for roads, schools, and other things required by new communities or in old communities by the rapidly expanding requirements of the new age, bore heavily on the agricultural people. If to these things was added a heavy burden of mortgages with high interest rates the farmer naturally felt that he did not have a fair deal in a country where wealth was tending to accumulate more and more in comparatively few hands. Though for a brief time after 1880 the farmers were somewhat more prosperous the locking up of vast sums of money in farm lands and railroads again caused financial difficulties, culminating in the panic of 1884. At that time the price of wheat fell to 64 cents a bushel. Agriculture then remained in a depressed condition for a number of years.

The First Mass Movement of Farmers

American farmers had from colonial times lived comparatively isolated lives on separate farms, rather than in villages, and had prided themselves on their independence. Such societies as had arisen among them had had a small membership composed largely of the more wealthy and better educated men, many of whom united farming with other pursuits and were more or less influential in public affairs. It is an interesting fact that when the time was ripe for the first mass movement of American farmers to better their condition it was brought about through the activity of a very small number of this same type of men. And it is also noteworthy that it paralleled the attempt of the laboring men of that time to form a broad organization through a secret society, such as the Knights of Labor.

In 1866 when agricultural and other conditions in the South were giving the country much anxiety President Johnson consulted the United States Commissioner of Agriculture, Isaac Newton. The result was that Oliver Hudson Kelley, a native of Boston, Massachusetts, who in 1849 had taken up farming at Ithaca (Elk River Township), Minnesota, and was at this time a clerk in the Department of Agriculture, was

sent South to study conditions there. He found that his membership in the Masonic Order made him an acceptable visitor to many Southern people. This suggested to him that a secret farm organization with a ritual and different orders would be a good thing and when later he visited his niece, Miss Carrie A. Hall in Boston, she persuaded him to include the membership of women in the plan for this organization. Returning to Washington as an employee in the Post Office Department, he formed the acquaintance of W. M. Ireland, John Trimble, Jonathan J. R. Thompson and William Saunders, for many years in charge of the gardens and grounds of the Department of Agriculture, and the proposer in 1855 of a farm organization with National, State, county and neighborhood units. These men favored Kelley's project and he therefore elaborated his plan of organization and ritual. On December 4, 1867, these five men organized the National Grange of the Patrons of Husbandry, with Saunders as master and Kelley as secretary. Rev. A. B. Grosh and F. M. McDowell very soon joined this organization and are commonly included among the founders. The original objects of the grange were wholly educational and social. Previous to its organization Kelley stated his objects as follows:-

"While the order would aim to advance agriculture to a higher rank by encouraging education, it would at the same time naturally embrace the benefits to its members guaranteed by Masonry. * * * The grand head of the order will be an auxiliary of the Department of Agriculture. * * * I should advocate the Department sending out agents, men of known ability, who should be versed as botanists, horticulturists, entomologists, etc., who should deliver lectures for the organizations and to which the Order should invite the public. * * * Now what I design is this: an order that will create an interest and keep it up. * * * A cordial and social fraternity of the farmers all over the country. Encourage them to read and think." (69) ^ In his first printed circular issued November 1, 1867, he stated that its main object is "to encourage and advance education in all branches of agriculture" and in the circular of February 3, 1868, "with regard to the modes of education, mention may be made of mental instruction through the reading of essays, and discussions, lectures, formation of select libraries, circulation of magazines, and other

publications touching directly upon the main subject desired, namely, those inculcating the principles governing our operation in the field, orchard and garden. Mr. Saunders in 1870 said that "to increase the products of the earth by increasing the knowledge of the producer is the basis of our structure; to learn and apply the revelations of science as far as it relates to the farmer's products of the vegetable world, and to diffuse the truths and general principles of the science and art of agriculture, are the ultimate objects of our organization."

When Kelley went out in February 1868 to organize granges and traveled across the country from Pennsylvania and New York to his home in Minnesota he had very little success. The further west he went the more he was reminded by the farmers that what they wanted was an organization to protect them against the injustices of railroads and middlemen in the transportation and selling of agricultural products and the buying of farm supplies and machinery. He yielded to this demand and in a circular of September 1868 broadened the objects of the grange, which now is "to advance education, to elevate and dignify the occupation of the farmer and to protect its members against the numerous combinations by which their interests are injuriously affected." This made the organization of granges in Minnesota easier and by 1869 there was a State grange in that State which wanted the Order to collect and disseminate information about crops, prices and transportation; establish depots in cities for sale of products, purchase and exchange of seeds; a labor office; and testing of farm supplies and implements. They appointed that year a State agent to buy supplies and implements and issued the first grange paper. By 1870 there were 40 granges in Minnesota. In 1871 130 new local granges and 2 State granges were formed. Grange agencies were established in several cities and the movement for grange stores began. That year the somewhat mythical character of the National Grange was disclosed when for the first time the masters of the State granges were invited to attend its annual meeting at Washington. 1,105 local granges were organized in 1872 of which 652 were in Iowa. All sections of the country including 25 States

now had granges and there were 10 State granges. The celebrations and picnics of this Order brought thousands of farming people together. The first delegate session of the National Grange was held in January, 1873, at which 23 men and 4 women represented 11 States. The order grew very rapidly and 32 State granges were represented the next year in the National Grange. A famous "declaration of purposes" was issued at this time. "We propose meeting together, talking together, working together, buying together, selling together and, in general, acting together for our mutual protection and advancement as occasion may require. *** For our business interests we desire to bring producer and consumers, farmers and manufacturers into the most direct and friendly relations possible. Hence we must dispense with a surplus of middlemen." ⁽⁴⁾ Transportation companies of every kind are necessary and every State should increase facilities for transporting cheaply. "We shall advance the cause of education among ourselves and for our children, by all just means within our power. We especially advocate for our agricultural and industrial colleges that practical agriculture, domestic science, and all the arts which adorn the home, be taught in these courses of study." Conditions arising out of the panic of 1873 greatly intensified and broadened the discontent of the farmers. As a result the membership of the granges grew with marvelous rapidity and reached its maximum of about 1,000,000 men and women in 1875. Meanwhile the order had embarked on an extensive program of cooperative buying and selling, including numerous agencies and stores. Even the manufacture of implements and other articles and the management of banks and life and fire insurance companies were undertaken. In his history of The Patrons of Husbandry, Professor Atkeson, long the representative of the National Grange at Washington, writes of this period as follows: "The Grange made its greatest growth during the panic years from 1873 to 1876, which drove it into a nation-wide attempt to counteract the cruel wrongs and oppression that agriculture was then laboring under, by cooperative protection of the farmers' community

interests.*** The Grange made the most gigantic effort at rural cooperation ever
(4)
attempted." The time was not ripe for such a movement in this country and most of
these cooperative enterprises failed. However, through them the farmers discovered
the real value of the services of middlemen, merchants and manufacturers and the
advantage of direct and large purchases. They were to a certain extent able to
modify the existing credit systems. Many farmers got a training in business methods.
They learned the power of organization and service and from that time have used it
for business purposes in increasing measure.

The Grange was also very prominent and influential in a broad agrarian move-
ment which sought to improve the conditions of agriculture and rural life through
legislation. Numerous farmers' clubs participated in this movement as well as larger
organizations, such as the Farmers' Alliance, which became competitors of the Grange.
It is, however, generally known as the Granger Movement. This was most influential
in the North Central States, California and Oregon. Its greatest effort was to se-
cure public control of railroads by the States. It secured the passage of laws for
the establishment of maximum rates of transportation, the creation of State railroad
commissions, prevention of pooling, prohibition of free passes to public officials,
etc. There was also much agitation for Federal control but attempts to secure legis-
lation on this subject by Congress failed. In his work entitled "The Granger Move-
ment", S. J. Buck of the University of Illinois, sums up the results of this effort
as follows: "On the whole it seems that the immediate economic results of the Granger
agitation for railroad regulation were small. *** The indirect and political results
of the movement, however, were more important; it led to decisions by the United
States Supreme Court which established the right of ^{the} state to control railroads;
(23)
and it laid the foundation for later legislation." ^ This movement also brought about
State reforms in taxation, public education, the establishment of boards of agricul-
ture, the collection of agricultural statistics, etc.; and in the local communities
favorably affected many interests. In educational matters the Grange stood for the
improvement of the rural schools, and from 1878 favored the teaching of agriculture

in these schools. While it often criticized the land-grant colleges and in some States attempted strongly to change the character of their agricultural instruction it favored liberal State and Federal support of these institutions and at times helped materially to promote their growth. It also worked efficiently toward the strengthening of the United States Department of Agriculture and the State and Federal legislation for the establishment and maintenance of the agricultural experiment stations.

The failure of its cooperative enterprises and dissatisfaction and differences of opinion regarding its legislative efforts led to a very large decline in the membership of the Grange after 1875 and in 1889 it had only about 100,000 paid members. In many localities it disappeared, particularly in the South and West. In the Northeastern and a few North Central States it reverted very largely to its original status as an educational and social organization. On this basis it has done much useful work and in recent years has spread out more widely and again has become one of our largest and most influential farm organizations. As a social organization through its local, state and national meetings and even its business enterprises it has brought large numbers of the farming people together for instructional, recreational and charitable purposes. In its recognition of the activities of women and young people as essential and important elements in the social life of the farm home and rural community it has done much to better the conditions of country life. It has promoted temperance, good manners, thrift, kindness to animals and other desirable features of life among the farming people. Educationally the local granges have been in a sense literary societies in which the officers called lecturers and others have discussed many interesting subjects and encouraged their hearers to read more about them. Thus the Grange has promoted the wider use of books, magazines, and papers bearing on the problems of agriculture and country life and has itself published journals, handbooks, etc. It has supported scholarships at some of the agricultural colleges. Many members of the Grange have taken part in

the Farmers' Institutes and other extension activities or have sent members of their families to the agricultural schools and colleges.

General Educational Progress

As population spread westward between 1870 and 1890 the free public schools of elementary grade greatly increased in number. In the South public school systems were established and had considerable growth during this period. The States generally took more interest in education, organized or strengthened departments of education and materially increased school appropriations. The public high schools greatly increased in number and attendance. By 1890 there were in North Atlantic States 786 high schools, in the South Atlantic States 115, in the South Central States 158, in the North Central States 1376 and in the Western States 91, making a total of 2,526. The principle of public support of higher education had been generally adopted. There were State Universities in 33 States, of which 16 had been opened for students after 1865. The courses of instruction in the high schools and colleges were greatly broadened. The free elective system which had been begun by Harvard University in 1867 under the leadership of President Eliot spread rapidly throughout the country during this period. The teaching of the natural sciences was much broadened and specialized and the laboratory method was widely used. The applications of science to the mechanic arts greatly increased in variety and there was enormous development of manufacturing, railroading, mining, irrigation, road and bridge building. Persons versed in science or engineering were therefore in great demand, as experts or teachers. The land-grant institutions especially felt the influence of this demand and enlarged their departments of science, mechanic arts and engineering to meet it. Students flocked into these departments because the prospect of profitable employment for those who pursued such courses was so bright.

Agricultural Education and Research in this Period.

Over-production of agricultural products by comparatively crude methods and the depression of agricultural values during this period deterred young men from entering the agricultural courses of the colleges. Even the members of farm organizations which advocated agricultural education often advised students to keep out of the agricultural courses. Much of the agricultural instruction given in the colleges was either too theoretical or did not rise above the level of informational accounts of the farm products and operations. There was in this period little systematic effort to improve agricultural instruction pedagogically or systematically. Each teacher of agriculture very largely went his own way. Courses were often arranged to catch students or to meet the needs of young, ill-organized and poorly equipped institutions. In many of the land-grant institutions the agricultural departments were completely overshadowed by the popular courses in engineering, general sciences and liberal arts. Nevertheless, agricultural instruction was broadened in scope and the way was opened for the great and rapid development which was soon to follow. A beginning was made in the preparation of suitable textbooks and manuals of agricultural subjects, though less than 100 books on agriculture and related sciences were issued by agricultural college men up to 1895, as compared with nearly 300 in the next decade. It was in this period that Professor Henry of Wisconsin University, seeing the small demand for advanced agricultural instruction organized the first successful short course in 1886 and four years later the special dairy school for the practical instruction of men to manage creameries and cheese factories.

We have seen how from the beginning men who in the early societies advocated the establishment of agricultural schools and colleges expected to make experiments and scientific investigations a part of the work of these institutions. This was included in the consideration of the land-grant act of 1862. As soon as colleges were established under this act they undertook such work. Little was accomplished during the first decade but before the end of that period it became apparent to a

number of men engaged in the work of the agricultural colleges that progress in agricultural instruction depended very largely on the accumulation of agricultural knowledge through systematic investigation and experimentation. Professor Hilgard dates the beginning of the experiment station movement in this country from the time of the meeting of the representatives of the land-grant colleges at Chicago in 1871 (See p.), but before this Professor Johnson and his associates in the Yale Scientific School in Connecticut had inaugurated work looking toward the establishment of such stations. The experiments of Lawes and Gilbert at Rothamsted, England, the investigations of Boussingault in France and the organized work of experiment stations in Germany had already attracted attention in this country. From 1855 the United States Patent Office had employed men to conduct investigations in entomology, chemistry and botany and this work was enlarged after the Department of Agriculture was established in 1862.

In 1870 The Bussey Institution (See p. 192) was established as a branch of Harvard College to give instruction in agriculture and related sciences. In the same year the trustees of the Massachusetts Society for Promoting Agriculture granted to the corporation of Harvard College a considerable sum "for the support of a laboratory and for experiments in agricultural chemistry, to be conducted on the Bussey estate". As soon as the laboratory was completed in 1871, F. H. Storer, the professor of agricultural chemistry and his assistants began field tests and chemical analysis of fertilizers. Reports of this work and of investigations on hybridizing plants, the composition of feeding-stuffs, injurious fungi, etc., were soon published. The great fire in Boston in 1872 and the commercial crisis of 1873 crippled this institution financially and it did little more original work for a number of years. However, in 1887 Professor Storer published a book entitled "Agriculture in Some of its Relations with Chemistry", which was long used as a text-book in our agricultural colleges. (263)

Development of the United States Department of Agriculture

The United States Department of Agriculture, established by the Act of Congress of May 15, 1862, as an outgrowth of the agricultural division of the Patent Office, became increasingly an important factor in the promotion of agricultural education and research. It published accounts of the progress of the land-grant institutions and in other ways aided their agricultural work. It distributed seeds and plants collected from domestic and foreign sources. For a number of years the grounds where department buildings now stand were used for field experiments. It published agricultural statistics and developed a system of crop reporting. Investigations in agricultural chemistry, economic entomology, agricultural botany, forestry, economic zoology, and animal diseases were undertaken and results of large importance in some of these lines were obtained within the first twenty-five years of the Department's operation.

Early State Experiment Stations

The dearth of agricultural students in the land-grant colleges gave the teachers in the agricultural departments of these colleges more time for experimental work and they turned their attention to such work with increased zeal during this period. In 1872 at a convention of representatives of agricultural colleges held in Washington in response to a call issued by the United States Commissioner of Agriculture, the question of the establishment of experiment stations was discussed and the report of a committee in favor of such institutions was adopted by the convention. (532) (See p. 537) The University of California decided in 1873 to organize an experiment station and this was done by Professor Hilgard almost as soon as he went to the university in 1875. That year he equipped a laboratory for research in agricultural chemistry and began field experiments on deep and shallow plowing for cereals. Meanwhile Professor Johnson was attempting to secure the definite organization of an experiment station in Connecticut. Peculiar circumstances enabled Professor W. O. Atwater who had studied agricultural chemistry in Johnson's laboratory and then in

Germany to actually establish the first State agricultural experiment station in the United States in 1875 at Wesleyan University, Middletown, Connecticut, but this was removed to New Haven in 1877 and put under Professor Johnson's direction. (150) For several years its work was carried on in the laboratory of the Sheffield Scientific School. In 1877 the North Carolina Experiment Station was established by the State legislature and located at the State University, which was then a land-grant institution. In New York the Cornell University Experiment Station was organized in 1879 by the voluntary action of the faculty of agriculture of the University and the following year the New Jersey State Experiment Station was created in connection with the Scientific School of Rutgers College. Prior to the passage of the Hatch Act in 1887, stations were also established in connection with the land-grant institutions in Alabama, Indiana, Kentucky, Louisiana, Maine, Massachusetts, Minnesota, Nebraska, New Hampshire, Ohio, Tennessee, Vermont, and Wisconsin. Experimental work in agriculture was also carried on in increasing measures at other land-grant colleges during this period. The results of the experimental work of the colleges and stations, while limited in extent and importance, were widely disseminated through their publications and the press.

As early as 1872 the need of increased funds for the land-grant colleges had been so impressed on Mr. Morrill, that he introduced in Congress, a bill for their further endowment by the Federal Government and repeated this effort many times within the next 18 years. When this for the time being was unavailing, the colleges took advantage of the wide-spread popularity of the experiment stations and began to plead for national funds for their support. In 1882 Seaman A. Knapp, then President of the Iowa State College, drafted a bill for this purpose and secured its introduction in the House of Representatives. A convention of delegates of the land-grant colleges which met in Washington in 1883 discussed and indorsed this project and through their united action, together with the active support of the United States Department of Agriculture, the Grange and other friends of agricul-

United States in 1875 at 100,000

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tural advancement, the Experiment Station Act was passed four years later. The history of the movements for increased national support of agricultural education and research will be more fully treated in succeeding chapters.

During this period there was a great increase in the avenues of approach by the colleges to the farmers. The wide development of the granges, farmers' clubs, and other organizations gave the agricultural college workers very many opportunities for disseminating information through lectures, public or otherwise. The farmers' institutes grew materially in number and attendance. In a considerable number of States they were directly connected with the land-grant college and when otherwise organized, college officers were often regularly on their staffs. Legislatures were beginning to make special appropriations for the support of the institutes. County and state fairs became more numerous and the college workers made exhibits or addresses at many of these fairs. The agricultural papers increased in number and circulation and published a great many articles by agricultural college workers.

While the farmers were very often discouraged by their difficult situations in this period and therefore were not inclined to have their sons study in the agricultural courses of these colleges, they nevertheless wanted all the helpful information these institutions could give them. The general influence of the land-grant colleges among the farming people was therefore much strengthened and widened.

The attitude of the farmers, especially as they were represented by their organizations, in many States, was for a long time strongly in favor of land-grant institutions separate from the universities and this was intensified by the failure of the universities in most cases in the early years to attract any considerable number of agricultural students. This led to the separation of the agricultural college from the universities in Mississippi in 1880, North Carolina in 1889, Rhode Island in 1888, South Carolina in 1889 and Connecticut in 1893, and from Dartmouth College in New Hampshire in 1891. Between 1877 and 1893 separate colleges

were established in eight of the new Western States but in Idaho, Nevada, and Wyoming the agricultural work was connected with the State University. In Ohio an agricultural and mechanical college was broadened into a State University and in 1897 this was also done in Maine and more recently in Florida, Delaware, Maryland, New Jersey, and New Hampshire.

Typical land-grant institutions and their relations to agricultural education.

The conditions in the land-grant colleges, with special reference to agricultural education during the first quarter of a century after the passage of the Morrill Act of 1862, can best be shown by examples of the history of typical institutions during that period. Such examples are given in the following pages of this work.

Michigan Agricultural College (See also p. 240)

Michigan was the seventh State to accept the land-grant under the Act of Congress of July 2, 1862. The State Act of acceptance was passed February 25, 1863 and the State received scrip for 240,000 acres of land. An agricultural land-grant board of six State officers, including the Governor, ^{was} were created to have charge of the selection, care and disposal of the lands and was directed to invest the proceeds of the sales of these lands in such manner as would establish a perpetual fund, the annual interest on which should be regularly applied under direction of the State Board of Agriculture to the maintenance of the State Agricultural College. The lands actually located aggregated 235,663 acres and were strictly agricultural lands, timber lands being omitted. The sales were conservatively managed and the fund available to the college grew slowly. In 1887 the land-grant fund in the State treasury amounted to \$328,065. The balance due on lands sold was \$120,204. and the value of the land unsold, 122,404 acres at \$5 per acre, was \$612,023. As the lands were sold, the amounts received were turned over to the State Treasurer and loaned on a book account to the State at 7 per cent interest and this interest was paid to the college, beginning with 1870.

In 1862 the State appropriation for current expenses was \$10,000; it rose to \$20,000 in 1867 and remained at about this amount until 1874 when it dropped to

to \$13,000; for the next ten years it ranged from about \$5,000 to \$8,385 and then disappeared altogether for 15 years. Appropriations for buildings and other special purposes began in 1869 and until 1887 ranged from \$3,000 to \$43,720. Up to that time the income from the sale of salt spring and swamp lands ranged from \$10 to \$1,773 except that in 1867 it was \$7,608, in 1869 \$17,559 and in 1871, \$4,135. Under the land-grant of 1862 the college received \$2,720 in 1870 and this income gradually increased to \$20,935 in 1881 and from 1883 to 1887 was about \$30,000. The total income of the college in 1862 was \$10,218 and thereafter until 1888 ranged from about that amount to about \$40,000, leaving out of account the appropriations for special purposes.

When the land-grant act passed the college had been in operation five years and to comply fully with that Act needed only to have authority to give military instruction, which was provided for by a State Act in 1863. However, a separate mechanical and engineering division was not established until 1885, but civil engineering and subjects included in rural engineering were taught in this college even prior to the passage of the land-grant act. The State law of 1861 provided that

"This institution shall combine physical with intellectual education, and shall be a high seminary of learning in which the graduate of the common school can commence, pursue, and finish a course of study terminating in thorough theoretical and practical instruction in those sciences and arts which bear directly upon agriculture and kindred industrial pursuits." (271)

For 33 years the requirements for admission to the freshman class were "To pass a satisfactory examination in airthmetic, geography, grammar, reading, spelling, and penmanship. A knowledge of elementary algebra is desirable."

Beginning with 1861 the college had authority to grant the degree of Bachelor of Science to students who had completed a four years course. Even with these low requirements for admission it was necessary to have preparatory classes for many of the students. Conditions arising out of the Civil War, combined with other circumstances, made it very difficult to secure a student body

for this new type of education, or funds for the proper maintenance of the college. In 1863 the State appropriation was not made until three weeks after the beginning of the spring term and the papers gave the public the impression that the college would be closed. The total number of students that year was 60 and at one time only 48 were in attendance.

Theophilus Capen Abbot, who had been professor of history and English literature at this college, was elected president in December, 1862, and served in that capacity for 22 years. He also retained his professorship. In 1863 the other members of the faculty were:

Manly Miles, M. D., Professor of Zoology and Animal Physiology.
 C. A. Kenaston, A. B., Instructor of the Preparatory Class and Secretary.
 R. C. Kedzie, A. M., M. D., Professor of Chemistry.
 Albert N. Prentiss, B. S., Instructor in Botany and Horticulture and
 Superintendent of Gardens.
 Oscar Clute, B. S., Instructor in Pure and Applied Mathematics.

President Abbot was a graduate of Colby University at Waterville, Maine, and had studied at the Bangor Theological School; Professor Miles was a graduate of the Rush Medical School at Chicago, Illinois, had studied chemistry, zoology, comparative physiology and anatomy, and had been assistant state geologist and engaged in a survey of the State with special reference to its fauna. He was also familiar with practical agriculture and deeply interested in the applications of science to this art; Professor Kedzie was a graduate of Oberlin College and of the Medical College of the University of Michigan and had been a practicing physician in Michigan for eleven years; Instructor Prentiss had been an advanced student at the College from 1857 to 1861, and taught there from 1863 to 1869, when he became professor of botany and horticulture in Cornell University; Instructor, afterwards Professor Clute was a graduate of the College in 1862, and its president from 1889 to 1893, when he became president of the Florida Agricultural College.

In 1865 George Thompson Fairchild, a graduate of Oberlin College, joined the faculty of the Michigan Agricultural College as instructor in English literature and was promoted to the professorship of this subject the following year. He was also acting president, from 1872 to 1873. In 1879 he was called to the presidency of the Kansas Agricultural College.

The personal character, fine scholarship, and strong teaching of these members of the early faculty enabled the Michigan Agricultural College to develop successfully and strongly in its new field, to exert a broad influence on the development of the land-grant colleges and to gain the respect of educators in other types of institutions for higher learning.

The aims of the college as stated by President Abbot in catalogues from 1863 to 1882 were in substance as follows:

"The State Agricultural College proposes:

1st. To impart a knowledge of Science and its application to the arts of life. Especially are those Sciences which relate to agriculture and kindred arts, such as Chemistry, Botany, Zoology, and Animal Physiology, prosecuted to a much greater extent than in institutions where the study of their practical applications is not pursued. The instruction given in the Lecture room is illustrated and enforced by the actual and prolonged study of plants and animals, and of the various practices and experiments of the farm and garden."

* * *

"2nd. To afford to its students the privilege of daily manual labor. As this labor is to some degree remunerated, it might seem intended only to lessen the expenses of the student. Its first use, however, is educational, being planned and varied for the illustration of the principles of Science. The preservation of health, and of a taste for the pursuit of agriculture, are two other important objects." ***

3d. To prosecute experiments for the promotion of agriculture. ***

4th. The organic law of the College, as well as the act of Congress donating lands for agricultural colleges, contemplate courses of instruction in the military art, and in the applications of Science to the various arts of life. Instruction to a limited extent, is already given in military field operations, hygiene, etc. Aside from this, the practical applications of Science are at present pursued mostly in directions desirable to the farmer - as surveying, leveling, laying out of grounds, mechanics, as applied to implements, buildings, stock-breeding, etc.

5th. To afford the means of a general education to the farming class. This the Agricultural College endeavors to supply. The labor system preserves the student's health, and the habits and love of wholesome work.

The professional part of the course gives him an insight into the nature of the objects and forces with which he has to deal. Added to this are the branches of study which help to make an intelligent and useful citizen, which cultivate his taste, and enable him to give expression to his knowledge and opinions." (271)

The small faculty was poorly paid even for those days, the President receiving only \$1,500, the Professor of Chemistry \$1,000, the Professor of Zoology \$1,000, and the Instructor of Mathematics \$600.

The course of study offered in 1863 was as follows:

Preparatory Class.

First Half-Year. - Arithmetic, Descriptive Geography, English Grammar.
Second Half-Year. - Algebra, Natural Philosophy, Composition.

College Course. - Freshman Class.

First Half-Year. - Algebra, Geology, Geometry, Book-keeping.
Second Half-Year. - Trigonometry, Surveying, Entomology, Principles of Stock-breeding, History.

Sophomore Class.

First Half-Year. - Physics, Structural Botany and Vegetable Physiology, Elementary Chemistry.
Second Half-Year. - Physics, Analytical Chemistry, Systematic Botany, Horticulture.

Junior Class.

First Half-Year. - English literature, Agricultural Chemistry, Animal Physiology.
Second Half-Year. - Industrial Drawing, Landscape Gardening, Rhetoric, Zoology.

Senior Class.

First Half-Year. - Inductive Logic, Mental Philosophy, Civil Engineering.
Second Half-Year. - Astronomy, Moral Philosophy, Political Economy.

Declamations every six weeks during the course. Composition every two weeks. Drill in Infantry Tactics twice each week. A lecture is given in the Chapel each Tuesday afternoon as follows:

On Horticulture, the first Tuesday of each month.

On Applications of Chemistry to the Arts, 2nd Tuesday.

On Manual Operations on the Farm, 3d Tuesday.

On Care and Feeding of Domestic Animals, Health, and on various topics, 4th and 5th Tuesdays.

On Military Hygiene, the 1st Friday.

On Military Fortifications and field operations, the 3d Friday. (271)

No electives were offered to students in the regular college course until 1883, when Seniors were permitted each term to select three out of five studies.

Daniel Strange of the class of 1867 thus described the equipment of the college in 1864:

"When I entered in '64, aside from the one dormitory, there was but the one College Hall devoted to instruction. This, of course, housed the library, museum, chemical laboratory and all biological laboratories, if indeed any could be said to exist. The farm buildings were but the one large cattle barn, a very small brick horse barn and a pig sty. The teams were two worn out horse teams and two good ox teams. There were three shorthorn cows, two Devon cows, and a bull of each of these breeds. There were a few grade cattle and Suffolk and Essex swine, but I think no sheep until the following year.

There were four small brick cottages for the president and professors. The above with the farm constituted the College's material equipment." (271)

There was no regular professor of agriculture until 1865, when Dr. Miles was made professor of practical agriculture and superintendent of the farm. The following is a partial outline of the course in agriculture announced in the catalogue of that year:

Practical Agriculture.

First Year.

Laying out of farms;
Farm fences;
Arrangement and planning of farm buildings;
General principles of tillage;
Principles of drainage;
Laying out and construction of drains;
Implements for preparing the soil for crops;
Mechanical preparation of the soil;
Methods of seeding;
Implements for seeding - their construction and management;
Harvesting crops;
Implements and machines used in securing crops;
Principles of stock-breeding;
Breeds of domestic animals - their characteristics and adaptation to particular purposes.

Fourth Year.

General principles of farm economy;
Manures - their management and mode of application;
Succession of crops;
Preparation of the soil for particular crops;
Cultivation of grain crops;
Cultivation of root crops;
Management of grass lands;
Stock husbandry;
Care of animals and principles of feeding;
Fattening of animals;
Management of sheep. (271)

The provision in the State Act of February 12, 1855 requiring the students at this college to engage in manual labor was faithfully carried out. In 1865 "All the early spring was devoted to cutting wood on the ground, where buildings and rooms were heated by wood stoves. During the growing season about all of the work on farm and garden, except teaming, was done by students." The assignments of labor were rotated so that "each student was made practically familiar with the different kinds of work." The class-room instruction was given in the forenoon. Until about 1889 all students were compelled to work from 12 to 15 hours a week and received wages which helped toward paying their college expenses.

After that time until 1894 students who showed proficiency in farm operations were given educational labor and later educational field work or laboratory work was substituted for all compulsory labor.

For a considerable period the original system seemed to work well. In 1869 President Abbot reported that:

The system ~~has~~ proved itself to be a good one, and gives better and better satisfaction to both officers and students, from year to year. With the instruction which accompanies the labor, the student obtains much valuable information of a practical character, which could be obtained in no other way.

But gradually difficulties in maintaining it and doubts as to its educational value increased. Efforts to connect the instruction of the classroom and laboratory with the field work were made but did not prove very successful under the conditions then prevailing at the college. The difficulties increased with the growth of the student body and are described by Dr. Beal as follows:

1. It was often very difficult to find profitable work at some seasons of the year.
2. The interruption of two short vacations in the growing seasons interfered with plans for continuous care of pieces of land.
3. Students all worked at the same time of day, beginning at one o'clock p. m., and on this account there were often too many of them to work to advantage. They seldom completed jobs they began, and thus lost interest.
4. As the numbers were large there were never enough skillful foremen, so that the students got into primitive methods of work, and formed bad habits.
5. As the student received pay he was earning something, and this often led the foreman to keep a man working at what he could do best, as is the custom in most factories, instead of frequently changing the kind of work, so that the student might gain skill in many directions. Besides, he almost always

preferred to work at what he could do best, thus insuring the highest rate of wages. His sentiment was, "Put me anywhere that I may perform good work, then I shall get the highest wages."

6. Students were much more sensitive about receiving less than the maximum rate of wages, than they were about receiving low marks for recitations in class. They often stoutly questioned the judgment of the foreman in placing an estimate on their labor, but usually acquiesced in the grade of marks given for recitations or examinations.
7. Too often the student felt that he accomplished little, and was working merely for the name of the thing. (271)

About 1882 it became necessary to have some class-work in the afternoon and as this increased it materially interfered with the old system of compulsory manual labor and gradually that was broken down. It then began to be seen that manual labor in agriculture and horticulture for college students must be put on a laboratory basis and made a definite part of the scheme of instruction and that wages should be paid only to the limited number of students who were employed as laborers in routine work about the college.

Professor L. H. Bailey in his report for 1886 states the new idea which was then beginning to take form at the agricultural colleges.

I adhere to the principle that the primary object of student labor, is to instruct the student. So far as possible, this labor should precede the lectures. No one can acquire the art of budding from a lecture. The student must perform the operation with his own hands. A man never learned how to build an engine from lectures alone. I lectured two days upon the practice of root grafting, whittling the stocks and scions and making particular mention of all the minor movements of the operation. The next day, when these students took the knives and material into their own hands, I was obliged to repeat all my former instructions. (273)

The class-room instruction was given in the forenoon and all the students were required to perform manual labor three hours each week-day. "All the early spring was devoted to cutting wood on the ground, where buildings and rooms were heated by wood stoves. During the growing season about all of the work on farm and garden, except teaming, was done by students." The assignments of labor were rotated so that "each student was made practically familiar with the different kinds of work." (278)

In his history of the college Dr. Beal thus comments on the early agricultural course:

"If this first course in agriculture seems somewhat primitive it must be remembered that the kinds of work on a farm and the methods of doing it then were very different from those of modern times. For example, in hay-making one man, or two, three, or more men would work, each with a scythe and each cutting about an acre in a day. A boy or man followed with a light fork spreading the newly cut grass. When the grass had dried to some extent, each man moved the hay about eight feet in one direction with a hand rake, the next carrying it another eight feet, and the third man moving it likewise. Very likely the windrow consisted of three rakings on each side. If very dry, the hay was loaded by hand, drawn to the barn and pitched off into the mow or stacked outside. Trained with such methods, reading little, possessing a very moderate education, we can hardly blame a young man for not attending an agricultural college. In 1857, and later in many portions of the state, the farmer needed to know how to cut down trees to advantage, to burn the brush when dry, to cut up and do the logging in due time, to harrow the land with an A-shaped harrow containing eleven or thirteen teeth an inch and a quarter in diameter, strong enough to bring up standing an ox-team without breaking. Then he sowed wheat by hand and harrowed some more. The next July he cut the wheat with a cradle, two to four acres a day, with a man following to rake and bind. He might burn the stubble, harrow and sow another crop of wheat, sometimes following with a third crop. He split rails and laid up a fence, seeded and pastured his land for a few years, then pulled out stumps with a yoke of cattle, possibly dug out and removed stones. He summer-fallowed the land to secure another crop of wheat. He had never heard of soil exhaustion, nor had he any knowledge of nitrogen, potash or phosphoric acid. Troublesome insects and weeds were few and bothered him little. He cleared one field after another to produce more crops. On the oak-popenings, after cutting the trees up to three or four inches in diameter, he broke the ground with a breaking-up team consisting of four or more yoke of oxen hitched to a stout home-made plow." (271)

In 1859 the Board of Vistors suggested that winter courses of lectures be given at the college. The Act of 1861 reorganizing the college provided "that the governing board may institute a winter course of lectures, for others than students of the institution". In 1867 a joint committee of the State Agricultural Society and the state legislature reported:

"That we are satisfied that the industrial interests of Michigan will be subserved and promoted by liberal appropriations on the part of the legislature for the support of the Agricultural College, including items for a winter course of lectures." (271)

At a meeting held in Detroit in January, 1867, the executive committee of the State Agricultural Society passed the following resolutions:

"Resolved, That we again recommend to the authorities of the college a course of lectures on agricultural and kindred subjects during the winter months, satisfied as we are that they would be largely attended by a class of farmers' sons who are partially released from the labors of the farm at this season of the year." (271)

The college year began late in February and continued until about the middle of November. By this arrangement students were employed on the farm during the growing season and such pay as they received aided them to meet their college expenses. It also enabled a considerable number of them to earn money as school teachers during the winter. Many colleges at that time had a long vacation in the winter for this purpose or made special arrangements for students engaged to teach school at that season. The Michigan Agricultural College continued to have the long winter vacation until 1896.

The methods of teaching employed at this college in early days have been described by Dr. C. E. Bessey, a student there from 1863 to 1869 and afterwards professor of botany and dean of the Agricultural College of the University of Nebraska, as follows:

"It was emphatically the period of the textbook. Some of the professors gave lectures, but in every subject the student always had his textbook as the basis of his study, and daily recitations were the rule. We learned things from books, and were asked to repeat them orally at greater or less length to our teachers. ***

Chemistry, even at that early day, was taught by practical work in the laboratory. We had one lecture or recitation a day, and in addition two hours daily of laboratory work. In the lecture the professor accompanied his presentation of the subject by carefully planned demonstration experiments, greatly to our edification, and occasionally to our amusement. In the laboratory we plunged at once into the qualitative analysis of unknown substances. We learned ~~that~~ to handle chemicals and apparatus by the very simple plan of actually handling them ourselves. ***

In marked contrast to chemistry, was the presentation of physics, which was wholly a textbook study. We used Olmstead's Natural Philosophy, reciting and demonstrating (on the blackboard) from its pages, but neither making experiments ourselves nor seeing any made by the professor.

Surveying was made a living subject for us by the addition to a stiff textbook, of a considerable amount of field-work, with compass, transit, and level, and the accurate plotting of results.

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Our geology was still a textbook subject only. There was no thought of the use of specimens of rocks or fossils by the class, nor was there any required field work in connection with the subject. Yet there were in the museum on the third floor many such specimens. ***

In zoology we used a textbook, but its required use was small, indeed. The professor (Dr. Miles) loved to talk to us, and he led us in his talks far deeper into the subject than did any textbook of that period.

Even the subject of entomology was mainly a textbook study. We memorized so many pages and repeated them as nearly as possible verbatim. Here we looked at specimens brought to the class. There was also some desultory collecting of specimens, and now and then a student was seen frantically pawing the air with a "bug-net", in his efforts to capture some beetle, bug, or butterfly.

In my own science of botany the work was then mainly confined to daily recitations from a textbook, accompanied later by dissections and 'analyses' of plants in the classroom, under the direction of the professor. We had a few simple dissecting microscopes which we used in these exercises. Here was no doubt the germ of the laboratory idea as applied to botany." (271)

Of the agricultural instruction at the college as he found it when he first came Dr. Beal says - "In 1870 it was not difficult to plan a course of study for an agricultural college. Except some points gathered from manual labor, which were not numerous nor very important, the students received, all told, eight weeks of daily instruction in horticulture and ten weeks in agriculture, and these topics were chiefly taught by the slow process of lectures. There were few books and papers to aid students in their pursuit of agriculture. The College was in the woods, so to speak, with no model to follow." (271)

The year 1870 was an important one in the history of the college. Influenced apparently by the example of the University of Michigan, whose regents had decided that year to admit women, the Agricultural College allowed 10 women to take work there that year. President Abbot advocated a course especially suited to women, including especially household economy, but this was not established until long after.

"They studied chemistry, botany, horticulture, floriculture, trigonometry, surveying, entomology, book-keeping, and other branches. Their progress in study was rapid and their improvement marked.

Work was furnished them when it could be; they prepared seed for the ground, cut potatoes, transplanted tomatoes and flowering plants, pruned shrubbery, gathered small fruit, did some work in the greenhouse and many other kinds of work." (271)

The lack of suitable quarters for women at the college prevented the attendance of any considerable number and as late as 1886 there were only 12 women students. In 1895 the college building known as Abbot Hall was devoted

to the exclusive use of women students as a dormitory and a laboratory for a course in home economics.

Up to 1870 the college had had a severe struggle for existence. Its income had been less than \$40,000 but that year the State appropriation was \$70,000 including \$10,000 for a chemical laboratory, the first laboratory building erected on the campus. The faculty was enlarged from 4 to 7 professors, the number of students increased and from that time the value of the institution in the educational system of the State was increasingly appreciated by the public.

That year William James Beal, then professor of natural history in the old Chicago University, came to the college to lecture in botany and in 1871 became professor of botany and horticulture. He was a graduate from the classical course of the University of Michigan and also had the degree of bachelor of science from Harvard University where he had studied under Asa Gray, Jeffries Wyman and Louis Agassiz. He brought to the college full information regarding the new methods of scientific study then being introduced in this country under the inspiring leadership of Agassiz and was able to adapt those methods to the peculiar conditions at the agricultural college. He was also largely influential in broadening and strengthening the scientific work of the college. His students were required to make observations of living plants, as well as dried specimens, and record them in notes and drawings. The college herbarium was greatly enlarged, particularly as regards the Michigan flora, and the plantations of horticultural and other plants on the college grounds were also increased in variety and extent. In 1873 plats of different kinds of grasses and clovers were planted and in 1877 a botanic garden was begun. In this garden and other places at the college ultimately at least 5,000 species and varieties of plants were grown. An arboretum begun in 1875 had at one time 215 species of trees and shrubs.

The daily program of studies in 1871 was as follows: (271)

First Term

Class	8 a. m.	9 a. m.	10 a.m.	11 a. m.
Senior Class)	:	:	:	:
)	:	:Agriculture:	Astronomy	: Landscape Garden-
:	:	: Zoology	: French	: Civil Engin- ing
:	:	:	:	: eering
Junior Class)	: Analytical chemistry	:Analytical	: Praxis,	: Drawing, 6 weeks
:	:	: Chemistry:	4 weeks	:
:	:	:	: Anal. Chem.:	:
:	:	:	:	:
Sophomore)	:	:	:	:
Class)	:	: Eng. Lit.	: Praxis,4wks:	: Elem. Chem.
)	:	:	: Botany	:
:	:	:	:	:
Freshman)	:	:Praxis,	: Algebra	: Book-keeping,
Class)	:	: 6 weeks	:	: 6 weeks
:	:	:History	:	: Phy. Geog.
:	:	:	:	:

Second Term

Senior Class)	:	: Mental	: Moral	: French
:	:	:Philosophy	: Philosophy	:
:	:	:	: Polit.Econ.:	:
:	:	:	:	:
Junior Class	:	: Mechanics	: Physiology	: Chem. Physics
:	:	:	:	:
Sophomore)	: Analytical Chem.	:Anal.Chem.	: Praxis,	: Botany, 10 weeks
Class	:	:	: 3 weeks	: Horticulture
:	:	:	: Anal. Chem.:	:
:	:	:	:	:
Freshman	: Agriculture	: Praxis, 4	: Algebra	:
Class	:	: weeks	: common	:
:	:	: Botany	: Geometry	:

That year there were 141 students, including 1 graduate student, 12 seniors, 9 juniors, 26 sophomores, 81 freshmen, 4 special, and 8 women.

The number of students fluctuated in the following years. In 1883-84 there were 171. That year there were 10 professors, including those in practical agriculture, horticulture and veterinary medicine, and assistants in chemistry and mathematics. In practical agriculture the course included lectures two terms in

sophomore year, and a half-term in senior year, with a term's work in agricultural engineering that year. The students began to do a little stock judging on the college herd. In horticulture there were lectures on landscape gardening one term in sophomore year and in general horticulture two terms in junior year. In veterinary medicine there were lectures and demonstrations three terms in senior year. On the college farm 200 acres were still in the original forest, 110 acres in pastures, 180 in crops grown in rotation, 10 acres in experiments, and about 100 acres in lawns, building sites, gardens and orchards. The college buildings included 3 substantial brick halls for classrooms and dormitories, a chemical laboratory, a botanical laboratory, a library and museum, a small astronomical observatory, a carpenter's shop, a large greenhouse, and separate barns for cattle, horses, sheep and grain.

Students in the regular agricultural course did not aggregate more than 209, except from 1886 to 1888, until 1910 when they numbered 313. Thereafter their numbers materially increased. The total attendance at the college was greatly increased after the establishment of the engineering division, which began with 35 students in 1886 and enrolled 414 students in 1910.

The number of graduates in the agricultural division ranged from 5 to 30 between 1870 and 1880 and from 11 to 38 between 1881 and 1910. Graduate students ranged from 1 to 7 between 1871 and 1885, and from 11 to 37 between 1886 and 1897, after which there were not more than 9 for many years.

In 1885 Edwin Willits became president of the college and undertook the establishment of a course in mechanical engineering. Thus the college passed into the class of agricultural and mechanical colleges. The faculty was increased by the addition of professors in military science and tactics and in mechanics and French. In 1887-88 there were also 3 assistant professors and 2 instructors. The students numbered 312. The buildings had been increased by a veterinary laboratory, a mechanical laboratory and workshop, and a barn for experimental feeding. The course in practical agriculture had been changed to include lectures one term in

freshman year and two half terms in sophomore years with electives for seniors during two terms. The required work in agriculture was given in three series of lectures covering drainage, rotation of crops, manures, cultivation, stock breeding and feeding, "farm economy", accounts, "selling", farm law, history of agriculture and agricultural literature. "A practical familiarity with the system practiced on the college farm fixes in the student's mind the instruction received in the class-room." The scientific basis of agriculture continued to be taught in the departments of chemistry and botany. L. H. Bailey served as professor of horticulture from 1885 to 1888. His lectures were supplemented by the text-book and more definitely related field work. "The first distinctively horticultural laboratory in this country" was built at this college in 1887.

Experimental work in agriculture has been carried on at the college since its establishment. Provision for a record of experiments on the college farm was made in the act establishing the college and in the act of March 15, 1861, re-organizing it. The first account of experiments at the college appeared in the annual report of the State board of agriculture for 1863 and thereafter each year until 1885 when the legislature authorized the college to issue and distribute bulletins containing reports on its experiments. In the department of chemistry analytical studies were made of Michigan soils, muck, wheat and sorghum, as well as of a variety of materials sent in by the farmers; field experiments were made with muck, composts and commercial fertilizers and meteorological records were regularly kept and published, beginning with 1863. In the department of zoology and entomology there was much work in the collection and study of injurious insects and later in their control. There were also experiments with bees. In the department of botany and horticulture, besides the extensive collection and study of the Michigan flora, field experiments were made with varieties of grasses, clovers, apples, pears, cherries, plums, grapes, small fruits, potatoes and other vegetables; breeding by selection and crossing of wheat, corn, beans, onions, tomatoes and other vegetables; root pruning of

corn, cultivation of an apple orchard, seed testing, etc. In the department of agriculture there were field experiments with the cereals, potatoes and root crops. In animal husbandry between 1864 and 1870 there were experiments in breeding sheep and cattle and in the feeding of pigs and sheep and later on there were feeding experiments with cattle, on the influence of different rations on the quality of milk, on the creaming of milk at different temperatures, etc. With the spread of the experiment station movement from about 1875 the experimental work at this college increased in variety and extent. In 1882 the college cooperated with Professor Atwater of Connecticut in the extensive series of experiments with nitrogen fertilizers then being conducted under his direction in a number of States. That year the college had a special State appropriation of \$1,000 for experiments in the making and use of silage, the culture of sorghum, and variety tests of grain and beets.

While the limited financial resources of the college and the pressure of other duties, especially with the increase in the number of students, prevented the development of experimental work on an extensive scale, sufficient useful experiments were made prior to the establishment of the Michigan experiment station to greatly strengthen the position of the college in its relation with the farmers of the State.

Farmers' institutes under the auspices of the college were begun in 1876, when two institutes were held. Thereafter until 1889 six institutes were held each year in different parts of the State and did much to bring the college to the favorable attention of the farmers. From its beginning the college had the active support of the State Agricultural Society, but the number of members of this organization was small. From 1875 a broader influence on the development of the college was exerted by the Grange, which favored liberal appropriations for its support and otherwise aided its work. The Grange was much interested in the experiments carried on by the college and in the farmers' institutes.

The general influence of this college on the movement for agricultural education and research during this period was also quite important. It so maintained its distinctive character as an institution primarily for agricultural education that it attracted much attention from the friends of such education throughout the country. Its teachers and graduates were much sought for by the land-grant colleges in other States. Up to 1880 Dr. Miles had been taken by the University of Illinois, Professor Prentiss by Cornell University, Professor Ingersoll by Purdue University, Professor Tracy by the University of Missouri, Professor Daniells by the University of Missouri, Professors Fairchild and Shelton by the Kansas Agricultural College, Professor Annis by the Colorado Agricultural College, Professor Bessey by the Iowa State College, Professors Gulley and R. F. Kedzie by the Mississippi Agricultural College, Professor Georgeson by the Texas Agricultural College. Eugene Davenport graduated at the Michigan Agricultural College in 1878 and was Professor of Agriculture at this college for a short time before entering on his broad career of leadership in agricultural education as dean of the College of Agriculture of the University of Illinois. Liberty Hyde Bailey was a graduate of this college in 1882 and immediately became an assistant to Professor Asa Gray of Harvard University, returning to his Alma Mater as professor of horticulture and landscape gardening in 1885 whence he went in 1888 to be professor of horticulture and later dean in the College of Agriculture of Cornell University. In 1880 Professors Beal, Kedzie and Cook took a prominent part at Boston, Mass., in the formation of the Society for the Promotion of Agricultural Science and Dr. Beal was its first president.

During the first 30 years this college gave more or less instruction in the theory of agriculture and in the related sciences to about 4,000 students, of whom about 400 completed the regular college course. About half of these students engaged in agriculture in Michigan and elsewhere and a considerable number of the graduates became teachers or investigators in agriculture or writers on agricultural subjects. Through their connection with agricultural colleges, societies, farmers' institutes, the agricultural press and in other ways the men and women who had studied at the

Michigan Agricultural College during these years exerted an important influence on the advancement of American agriculture.

Kansas State Agricultural College

The Kansas State Agricultural College had its origin in Bluemont Central College, chartered February 9, 1858, under the auspices of the Methodist Episcopal Church. As actually organized it was an institution of the ordinary classical type but its founders desired to make it helpful to the agriculture of the State. Its charter provided for "an agricultural department, with separate professors, to test soils, experiment in the raising of crops, the cultivation of trees, etc., upon a farm set apart for the purpose, so as to bring out to the utmost practical results, the agricultural advantages of Kansas, especially the capabilities of the high prairie lands." (199) In 1860 this college was offered to the State on condition that it be made the State University. After the passage of the Morrill land-grant act the authorities of the college again offered to donate it to the State and this offer was accepted in connection with the State's acceptance of the Federal college land-grant, February 3, 1863.

On February 19, 1863, as soon as the legislative resolution could take effect, the State of Kansas took over the property of Bluemont Central College Association located near Manhattan in the county of Riley, in fee simple.

Under the Morrill Act of 1862 Kansas was granted 90,000 acres of land. Three commissioners were appointed by the Governor to locate the lands. Some of the sites were within railroad limits and thus counted double. The final amount of land received by the State was 82,313.52 acres. In 1866, Hon. J. M. Harvey began the appraisal of these lands and completed the work on July 27, 1867. Hon. I. T. Goodnow, one of the founders of Bluemont College, was appointed land agent, which office he held until 1873 when about \$180,000 had been obtained from the sale of about 42,000 acres. Ten years later this fund had increased to about \$240,000, and in 1921 to \$491,746.74. This sum is invested in Kansas school and municipal bonds

paying 6 per cent interest. As late as 1907 the college received an additional grant making the 90,000 acres complete. This was not attained until after a legal contest and a long-time appeal to Congress. President Cleveland vetoed the first favorable resolution passed but President Roosevelt signed a later one.

The State appropriations from 1864 to 1873 ranged from \$2,700 to \$23,000 and totaled \$79,634; from 1874 to 1879 they amounted to \$78,287 and from 1880 to 1887 to \$121,961. The township of Manhattan in 1871 donated \$12,000 in bonds for the purchase of a farm.

On March 1, 1870 the following act was passed by the state legislature:-

"Whereas, The State of Kansas has heretofore advanced as a loan from time to time the several sums necessary to pay the salaries of professors in said College, thus complying with the condition that the institution should go into active operation within a limited time, and securing its benefits to the earlier pioneer settlers in the commonwealth: therefor,

Be it enacted by the legislature of the State of Kansas:

Section 1. That the several sums advanced to pay the professors in the Kansas State Agricultural College from the year 1863 to the year 1869, inclusive, be and the same are hereby donated to said College, together with all interest that may have accrued on said sums: Provided, That the amount hereby donated shall be used as the Board of Regents of said College may direct: to purchase additional lands for the College farm; to erect buildings; and to develop the Agricultural Department of said College: And provided, That the sum of \$1,500 may be appropriated from said donation for the purchase of a proper set of arms and accoutrements for the use of the drill class in the Military Department required by law in said College.

Section 2. The treasurer of the Board of Regents is hereby authorized to pay upon the orders of said Regents an amount equal to the sum donated by this act to said College out of any interest upon the endowment fund that may at any time be in his hands in excess of orders then due for professors' salaries: Provided, That if any order drawn upon said treasurer on account of the donation made by this act shall not be paid on presentation, said treasurer shall indorse thereon, 'Not paid for want of funds'; and any order thus indorsed shall bear interest at the rate of seven per cent per annum until paid."

"Immediately after the approval of this act, the Board of Regents had engraved or lithographed 364 pieces of scrip, so-called 'College greenbacks', of the denomination of \$100 each, made payable at different times for a period of eight years, beginning July 1, 1870. These orders were used in purchasing the farm and

supplies for the same, for boarding-house repairs, and for improvements of various kinds. On December 22, 1871, the issue of this depreciated paper was stopped by the Board of Regents, but the \$33,700 already issued proved a serious burden to the institution for many years, on account of the high rate of interest which prevailed at that time in Kansas. The greater part of this obligation(\$28,258.23) was paid in 1874 and 1875 - i. e., after the reorganization - but the remainder drew interest until 1881, when President Fairchild succeeded in convincing the legislature that it was their duty to provide for its cancellation."

"The board of State commissioners, in their reports for 1873 and 1874, intimate that the existence of the College greenback was the result of the incapacity of the management, and the legislature placed the charge heavily upon the shoulders of President Denison and his associates; but it should be remembered that the State refused to make appropriations to the College for 1866, 1870, and 1871, and that a public institution cannot, like an orchid, live on Kansas air and rain-water. As a State institution, it ought to have been sustained or abolished." (199)

In 1877 the legislature required that not more than \$15,000 annually should be spent to pay teachers until the debts of the college are paid in full and until "said college shall refund to the State all moneys advanced by the State to pay for instructors and running expenses."

When the agricultural college took over the equipment of Bluemont College it had only one substantial building, located on a farm of 100 acres. A boarding-hall which had been erected by private parties was purchased by the college. After the purchase of a second farm of 155 acres in 1871, later increased to 219 acres, separate buildings for horticulture, chemistry and mechanic arts and a part of a main college building were erected during President Anderson's administration. Under President Fairchild up to 1887 the main building was completed, a residence for the president, armory and greenhouse were erected and the farm buildings enlarged.

4.3.4
1863

As a State college the institution was opened for students September 2, 1863. Regarding its beginnings Professor J. D. Walters had written as follows in his history of the college:

"It is natural that the College should have remained for a time, as it did, under the care of its founders and generous donators, and should have conformed to the ideal before their minds. The charter provided for four departments - science and literature, mechanic arts, agriculture, and military tactics. Of these, that of science and literature was put in operation. The course was laid out to cover four years, with an indefinite preparatory, and conformed closely with that of Bluemont Central College. The first catalogue gives the names of ninety-four students in the Preparatory Department and fourteen in the College proper. Seventy-four were from Riley County. The ages of the students ranged from 9 to 27 years. Women were admitted as students and in 1868 there were 71. The Faculty consisted of Rev. Joseph Denison, D. D., A.M., president and professor of ancient languages and mental and moral sciences; J. G. Schnebly, A.M., professor of natural science; Rev. N. O. Preston, A.M., professor of mathematics and English literature; Jeremiah Evarts Platt, principal of Preparatory Department; Miss Belle Haines, assistant teacher in the Preparatory Department; and Mrs. Eliza C. Beckwith, teacher of instrumental music. The following is a copy of the first circular issued by the College:

The first term of this institution as now organized by the authorities of the State, under a board of experienced and competent professors and teachers, will commence September 2, 1863, and continue thirteen weeks. The Department of Music, both vocal and instrumental, will soon be organized, of which notice will be given in due time.

Every possible effort will be made to make the facilities for acquiring a full and thorough education in this institution equal to those of any other in the country. Its government will be firm, but mild and parental. Its aim will be to promote the highest welfare of the student, physical, mental and moral. Females as well as males will be admitted to all the advantages of the institution. Special instruction to those preparing to teach. All proper attention will be given to subjects relating to the Department of Agriculture. A course of lectures on practical farming and kindred subjects from competent men may be expected during the term.

The President of the institution will lecture on important subjects. Prof. J. G. Schnebly will lecture on subjects illustrated by the magic lantern, including astronomy, natural history, etc.; Prof. I. T. Goodnow, on inorganic, organic and agricultural chemistry.

Rates of tuition for term of thirteen weeks, to be paid in advance; Common English branches, four dollars. Higher English, algebra, geometry, languages, etc., five dollars. Music on melodeon, eight dollars; piano, ten dollars. Incidental expenses, for fuel, sweeping, and bell-ringing, fifty cents.

Special exercises in riding on horseback, calisthenics, gymnastics, etc., tending to promote the health and manners of the student, will be given without extra charge.

Board in private families, from two to three dollars per week."

President Joseph Denison was a farmer's son, a native of Massachusetts and a graduate of Wesleyan University, Middletown, Conn. After serving as a teacher and minister in his native State he came to Kansas in 1855 and was one of the prime movers in the organization of Bluemont College, and its third president. He was a conservative in educational matters and apparently was especially interested in the training of teachers for the rural schools. This was a matter of prime importance in the early history of the State. Lack of schools among the rural people made it very difficult for young people on the farms to prepare for college and therefore in the early years of the Kansas College most of the students were in preparatory classes.

Apparently there was from the beginning more or less pressure upon the college to do something for the promotion of agricultural education. The first year botany, general and agricultural chemistry, zoology and other natural sciences were included in the course of study, together with Liebig's husbandry, and in 1864 a separate agricultural course of three years was outlined in the catalogue. This included lectures and text-book work on fruits, treatise on the horse, book of the farm, diseases of domestic animals, agricultural chemistry and soil analysis.

In 1865 the scientific work of the college was strengthened by the appointment of Benjamin F. Mudge as professor of natural science and higher mathematics. He was a native of Maine, a graduate of Wesleyan University and State geologist in Kansas. The next year John S. Hougham was made professor of agricultural science and a more elaborate course in agriculture and science was offered in the catalogue. Professor Hougham was a graduate of Wabash College, Crawfordsville, Ind., and had been a teacher in Franklin College in that State. After leaving the Kansas College in 1872 he was for a time professor of agricultural chemistry in Purdue University.

In 1868 the preparatory course covered three years; the four-year courses were designated as agricultural and scientific, college, and military; mention was also made of mechanic arts, civil engineering, commercial and mercantile courses. That year the first farmers' meeting at the college was held.

The agricultural course, as outlined in 1869, included the following subjects: Freshman - soils, tillage, draining and fertilizers; Sophomores - crops and farm machinery, physiology and diseases of animals and horticulture; Juniors - field crops and animal husbandry; Seniors, history of agriculture and systems of agriculture. Excursions were taken for observation of farm operations.

In 1870 the catalogue gives in detail two two-year preparatory courses, one agricultural and the other literary, and four four-year courses, agricultural, mechanic arts, military science, and literary. That year Fred E. Miller, a graduate of the Michigan Agricultural College, became professor of practical agriculture and superintendent of the farm and Elbridge Gale, a graduate of Brown University, who had come to Manhattan in 1864 and established a nursery there, was made professor of horticulture and botany.

In 1871 the only courses offered were a two-year course in the preparatory department and a four-year course in the collegiate department. The catalogue stated there would be "from seven to ten hours of practical instruction in agriculture under Supt. Miller; in horticulture under Supt. Gale; and in mechanics * * * under Supt. Todd. ^ Students laboring in agricultural, horticultural and mechanical departments are paid by the hour." The annual report of the college for that year includes as lecturers C. V. Riley in entomology and H. J. Detmers of the Illinois Industrial University in veterinary science.

DEPARTMENT OF PHYSICS

PHYSICS 101

LECTURE 1

MECHANICS

AND ELECTRICITY

PHYSICS 101

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LECTURE 1

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The students in 1871 numbered 111 men and 72 women. There were 4 women graduates in the literary course and 1 man in the agricultural course, who was the first student to receive the degree of bachelor of science. In collegiate courses there were 3 seniors, 3 juniors, 2 sophomores and 7 freshmen in the literary course and 1 junior, 4 sophomores and 5 freshmen in the agricultural and science course. However, Professor Hougham reported 2 classes of 14 and 5 members respectively in agriculture, using Waring's Elements of Agriculture as a textbook. Thirty men and women attended lectures in horticulture and forestry. Thomas's American Fruit Culturist was used and there was practical instruction in root grafting, etc. The regular classes in agriculture and horticulture occupied two terms each. For practical work the classes were organized in divisions of 8 or 10 students with a leader. Four divisions of men and 1 of women did practical work on the farm and in the orchard, vineyard and garden. Labor was required for one hour on Monday and Thursday. Additional labor was voluntary and was paid from 3 to 15 cents per hour.

According to the Manhattan Standard trouble was experienced in engaging a professor of agriculture in 1871:

"Complaint has been made because the Regents have failed to secure the services of an agricultural professor. We are glad to see the interest manifested, even if it be a little overheated. We feel assured, however, that no one will find fault if he knows how much time has been spent in trying to secure a professor. In starting an agricultural department there is a necessity, first, to have the ground plowed and fenced. So, anxious was the president, Doctor Denison, that he by his own efforts raised \$1400 for this object. When the last legislature appropriated a sufficient additional amount to complete the fencing of the grounds, active exertions were immediately commenced by the Regents and Faculty to engage an agricultural professor. Even that able, enthusiastic agriculturist, Judge L. D. Bailey, was employed to engage one. As early as last April, a gentleman of eight years' experience in the Pennsylvania Agricultural College was elected, under promise of accepting if chosen. As professors are not usually overstocked with traveling money, and to render the thing sure, Doctor Denison borrowed \$250 for the professor to move on with! Untoward circumstances prevented his coming in the spring term, but we were confidently informed that his services might be had in September. He even promised to come on a salary of \$1500. The offer was promptly accepted, but again he failed to come to time. Numerous applications have been

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made in other directions, and still we are without an agricultural professor, and from no fault of the Regents or the Faculty. We will add, however, that an active correspondence is being held and we hope soon to secure a man worthy of the highest and most important professorship in the State."

Progress in establishing instruction directly relating to agriculture and other industries was not sufficiently rapid to satisfy the farmers of the State. The general atmosphere and influence of the college were too much on the side of classical and scientific education. The Grange grew very rapidly in Kansas at this time and by 1873 had great influence in the political affairs of the State. As a result the legislature passed an act, approved March 6, 1873, reconstructing the government of the State institutions. Under this act the Governor appointed a new board of regents for the Agricultural College. President Denison resigned and John A. Anderson was appointed to succeed him.

At that time the faculty was constituted as follows:

"Joseph Denison, D. D., president, and professor of history, political economy, and mental and moral philosophy. B. F. Mudge, A.M., professor of the natural sciences. Rev. J. H. Lee, A.M., professor of Latin and English literature. J. Everest Platt, A.M., professor of mathematics and teacher of vocal music. Dr. H. J. Detmers, V.S., professor of veterinary science and animal husbandry. Maj. Fred E. Miller, professor of practical agriculture and superintendent of the farm. Rev. E. Gale, professor of horticulture and superintendent of the nursery. Lizzie J. Williams, teacher of drawing, and tutor. Hattie V. Werden, teacher of instrumental music. Jennie Detmers, teacher of chemistry and German. Ambrose Todd, superintendent of shops and instructor in mechanics."

The ten years after 1863 showed very little growth in the college attendance. Up to 1873 only 15 students had graduated. The total attendance at any one term never reached 125. Professor Walters comments on this period in the history of the college as follows:

"The reason for this slow growth must be looked for in many directions: The newness of the State, the western location of Manhattan, the inadequacy of means, the founding of rival literary institutions at Lawrence, Baldwin, Topeka, etc., and the fact that industrial education was in its experimental stage. President Denison and a majority of the professors were classic students, and had no faith in the educational results of technical instruction not connected with the classics. They planned to add elective work in practical science and applied mathematics to the 'old education', but it was intended to supplement, and not supplant, this. The introduction of obligatory daily manual labor as an educa-

tional factor was not attempted. Aside from occasional lectures on general topics, little was done for agriculture and the mechanic arts, and the increasingly frequent demands for an institution that would educate towards, instead of away from, farm and the workshop were met with uncertain promises. The Board, largely composed of professional men, must have held similar views, though the report of the State commissioners of 1873 says that "attempts were made by members of this body at different times to change the curriculum of study, and in other respects to alter the running of the College so as to make it conform more nearly to the demands of the people."

It should not be assumed, however, that the institution failed of doing good work in its class rooms. The Literary Department was second to no higher school of the kind in the State. The catalogue of 1868-69 states that up to that time the College had educated at least eighty teachers for the public schools. A considerable number of ministers, especially of the M. E. Church, which still considered the institution as its protege, and reported it as such at the annual conference, also received their education here. Nor were the sciences entirely neglected. Benjamin F. Mudge, A.M., called to the chair of natural science in 1865, was an enthusiastic teacher and untiring explorer. Aided by some of his pupils, one of whom is now professor of anthropology in Chicago University, Professor Mudge made a large collection of geological specimens and donated it to the College, where it formed a nucleus of the present museum. Being the first 'take' in the new State, it contained many specimens which could not have been acquired later." (199)

President Anderson was a native of Pennsylvania and a graduate of Miami University. He had been a minister in California, chaplain in the army and a prominent worker in the United States Sanitary Commission. He had come to Kansas in 1868 as pastor of the Presbyterian Church at Junction City. He was a man of strong and positive character, well fitted to undertake the task of putting the college on a more practical basis.

His views of education, which molded the educational future of this institution, were as follows:

1. It is impossible for most people to find time to study everything that it is important for some man to master.
2. The subjects discarded, in whole or in part, by each separate class of students, should be those that it is supposed will be of least importance to them.
3. Of those retained, prominence should be given to each in proportion to the actual benefit expected to be derived from them.
4. The farmer and mechanic should be as completely educated as the lawyer and minister; but the information that is essential to the one class is often comparatively useless to the other; and it is therefore unjust to compel all classes to pursue the same course of study.
5. Ninety-seven per cent of the people of Kansas are in the various industrial vocations, and only three per cent in the learned professions; yet prominence is given to the studies that are most useful to the professions instead of those that are most useful

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- to the industrial pursuits. This state of things should be reversed, and the greatest prominence given to the subjects that are the most certain to fit the great majority for the work they should and will pursue.
6. Most young men and women are unable to go 'through' college. Therefore, each year's course of study should, as far as practicable, be complete in itself.
 7. The natural effect of exclusive headwork, as contradistinguished from handwork, is to beget a dislike for the latter.
 8. The only way to counteract this tendency is to educate the head and the hands at the same time, so that when a young man leaves college he will be prepared to earn his living in a vocation in which he has fitted himself to excel.
 9. Putting off the choice of an occupation until after the student leaves college as a graduate, instead of making it when he enters college, or as soon thereafter as possible, is a mistake.
 10. Some agricultural colleges take as an objective point the graduation of agricultural experts, experimenters, professors of sciences, editors, etc.; the Kansas State Agricultural College should take as an objective point the graduation of capable farmers and housewives, and it should make an effort to graduate thousands of such.
 11. Whatever else may yet need to be tried, there is no use in repeating the experiment of flying a literary kite with an agricultural tail, so often made in various quarters. It is a pleasant regential and professorial amusement, and quite attractive to an immediate locality; but there is nothing in it for the industrial student, whose estate pays for the kite. (199)

The Board of Regents, adopting these views, discontinued the division of literature and organized those of agriculture and the mechanic arts. Three new professorships were established: - botany and entomology, J. S. Whitman; chemistry and physics, W. K. Kedzie; mathematics, M. L. Ward. Professor Kedzie was the eldest son of Prof. R. C. Kedzie of the Michigan Agricultural College and a graduate of that college. He had also taken a special course at the Yale (Sheffield) Scientific School. Edward M. Shelton was made professor of practical agriculture and superintendent of the farm in 1874. He was a native of England but in 1860 had gone to Michigan where he graduated at the Michigan Agricultural College. For a time he was superintendent of a government experiment farm in Japan and later a member of the Greeley Colony in Colorado. The farmer's course and the woman's course covered 6 years and the mechanic's course 5 years.

Workshops in iron and wood, a printing office, a telegraph office, a kitchen laboratory and a sewing room were equipped. Fifty minutes of educational manual labor was added to the daily work of every student.

In 1876 the course of study was reduced to four years. The preparatory course was abolished and Butler's Analogy, Latin, German and French were discontinued. Admission requirements were lowered to reach the better grades of the public schools.

Throughout President Anderson's administration the great majority of the students were in the first year's course and only 25 graduated during his term of office. The regular teaching of agriculture was for a term in both the second and fourth years. There was also instruction in horticulture and agricultural chemistry. The agricultural operations of the college were greatly enlarged. A considerable number of students participated in the farm operations, experiments with crops and live stock were conducted and farmers' meetings were addressed.

To defend his educational policies, as well as to afford practice for the students in printing, President Anderson in 1875 established a weekly college paper called the Industrialist. This also furnished a medium for dissemination of information regarding the work of the college. Under Anderson's vigorous editorship this paper became widely known. It has been continued ever since but in 1897 was changed to a monthly magazine.

The number of students increased during the first years of Anderson's presidency but declined after 1876. There was much conflict both within and without the institution regarding his educational policies, which were radical and if fully carried out would have reduced the college largely to the status of a trade school. In 1878 he was elected to Congress and this led to his resignation in 1879.

His successor was George T. Fairchild, a native of Ohio and a graduate of Oberlin College, who had been professor of English literature at the Michigan Agricultural College and its acting president in 1873. He was a man of mature judgment, progressive ideas in education, and fine spirit. His ideal of education related to agriculture was set forth in an article written while he was at the Michigan College for the Chicago Farmers' Review, and afterwards published by the Michigan State Board of Agriculture.

"True scientific principles are to be taught and enforced by a thorough drill in observation. The eyes must see and the hands handle the very elements of nature, in order to gain proper ideas of nature's use. There must be a definite training to think accurately and connectedly, and intensely if need be.*****Added to this must be the formation of habits of ready action to a purpose. ***** The college must gather and impart the best of instruction in the art of tilling the soil.***** The course of study must be thorough and in this there must be systematic instruction by the most approved methods in the sciences, training to logical investigation of facts and principles, history and general knowledge of civilization enough to kindle inquiry and technical training enough to give a general ability. This involves a drill in manual labor that shall make the hands ready and the eyes quick."

By careful work and avoidance of antagonisms President Fairchild greatly strengthened the Kansas College. He established weekly faculty meetings, encouraged discussion of educational problems and created a loyal and united faculty. A single course of study with limited electives, especially to meet the requirements of men and women, was adopted. The requirements for admission were gradually raised and the industrial work of the students was extended, strengthened and systematized. The number of students increased from 276 in 1879-80 to 481 in 1886-87. During this period there was still great difficulty in holding students beyond the freshman year. In 1886-87 there were 303 freshmen (including about 75 pursuing preparatory studies), 100 sophomores, 44 juniors, 24 seniors and 10 post graduate students. The number of graduates increased from 7 in 1880 to 21 in 1886 and 1887. Agriculture continued to be taught in one term of sophomore and senior years. The number of students who gave special attention to agriculture continued to be relatively small. In 1882-83 the classes in agri-

culture included 7 seniors and 39 sophomores. There was also practical work in agriculture by 22 juniors and 12 sophomores. Dairying was taught to 7 women in the sophomore class. In 1886-87 there were 22 seniors and 49 sophomores in agricultural classes and 38 juniors and 38 sophomores in farm work. Horticulture was taught to 48 men and 31 women and practical work in horticulture was taken by 27 juniors and 29 sophomores. In other industrial work there were in 1885-86 54 students in telegraphy, 70 in printing and 240 in the mechanical department, mostly doing work in carpentering.

Experimental work was begun early in the history of the college. In 1867 500 forest trees, 200 apple trees and small numbers of other fruit trees were planted on the college farm. By 1873 the experimental forest contained 36,370 trees and there were many varieties of fruits being tested. Trials were being made of fertilizers, soil preparation, methods of planting, special crops, etc. In 1874 Professor Shelton introduced alfalfa and experiments were also begun with wheat, cow-peas, grasses and other forage plants. In 1883, 1884 and 1885 special publications were issued which showed a considerable range of experiments, including those in the seeding, cultivation, and manuring of corn, feeding of pigs, steers and milch cows, with special reference to the use in the rations of corn in different forms, alfalfa, and grasses. An annex to the college barn was built in 1884 for use in experiments with live stock.

Through the early experimental work in agriculture, horticulture and forestry a substantial basis was laid for the Kansas Experiment Station established after the passage of the Hatch Act.

A "farmers' institute" was held at Manhattan November 14, 1868, with the following program: Relation of the Kansas State Agricultural College to the Agricultural Interests, by President Denison; tree borers, by Professor Mudge; culture of forest trees, by E. Gale; and economy on the farm, by Professor Hougham. The meeting was also addressed by George T. Anthony, Editor of the Kansas Farmer,

There was also practical work in agriculture by 25 juniors and 15 sophomores. Dairying was taught to 7 women in the sophomore class. In 1885-87 there were 28 seniors and 49 sophomores in agricultural classes and 38 juniors and 38 sophomores in farm work. Horticulture was taught to 48 men and 31 women and practical work in horticulture was taken by 29 juniors and 39 sophomores. In other industrial work there were in 1885-86 54 students in telegraphy, 70 in printing and 240 in the mechanical department.

Experimental work was begun early in the history of the college. In 1887 200 apple trees and small numbers of other fruit trees were planted on the college farm. By 1893 the experimental forest contained 26,000 trees and there were many varieties of fruits being tested. Trials were being made of fertilizers, soil preparation, methods of planting, special crops, etc. In 1874 Professor Shelton introduced alfalfa and experiments were also begun with wheat, vetch, grasses and other forage plants. In 1883, 1884 and 1885 special publications were issued which showed a considerable range of experiments, including those in the seeding, cultivation, and manuring of corn, feeding of cattle, steers and milch cows, with special reference to the use in the regions of corn in different forms, alfalfa, and grasses. An annex to the college barnyard built in 1884 was used in experiments with live stock.

Through the early experimental work in agriculture, horticulture and forestry a substantial basis was laid for the Kansas Experiment Station established after the passage of the Hatch Act.

A "farmers' institute" was held at Manhattan November 14, 1888, with the following program: Relation of the Kansas State Agricultural College to the farmer; natural interests, by President Denison; tree borer, by Professor Hodge; culture of forest trees, by E. Gale; and economy on the farm, by Professor Hodge. A meeting was also addressed by George T. Anthony, Editor of the Kansas Farmer.

who published an eight column report of the institute in his paper.

January 2-10, 1872 a "well-organized and widely advertised farmers' institute under the auspices of the faculty, was held in Manhattan. It was well attended by representative farmers from all parts of the State." Some other more or less informal meetings of farmers were held at the college in its early days. Under President Fairchild's leadership a regularly organized system of institutes was inaugurated in 1881. At least six institutes were held each winter in as many different counties. Members of the faculty also attended meetings of granges and other farm organizations.

During the first twenty-five years over 2,500 students attended the Kansas Agricultural College, of whom about one-third were women. Most of these students remained at the college for only a part of the course and it has been estimated that three-fourths of these came from and returned to the farm. Up to 1890 there were 232 graduates, of whom 73 were women. Previous to 1877, with two exceptions, the 27 graduates received the A. B. degree. After that the B. S. degree was given. Only about 30 of these graduates became farmers or horticulturists but a number of them have occupied important positions as administrators, teachers, or investigators in Federal or state agricultural institutions. Through its instruction in the natural sciences and their applications to various useful arts, its development of systematic courses in home economics, its teaching of the theory and practice of agriculture and its insistence on the importance of vocational training, in connection with a more liberal culture, it laid a strong foundation for its future extensive growth and exerted a wide influence on the development of our system of higher education relating to agriculture and other industries.

Massachusetts Agricultural College (See also p. 288)

When the problem of the acceptance and disposition of the land-grant of 1862 was presented to the Massachusetts legislature by Governor Andrew in 1863 decided differences of opinion developed. This is shown in the report of the (249) joint committee on the Governor's message. ^ The committee argues that Massachusetts should provide institutions for mechanic arts, as well as agriculture. The resolutions adopted at a meeting in Boston February 16, 1863, are cited, which are in favor of having the Massachusetts Institute of Technology represent mechanic arts. The committee believes that agriculture should not be neglected, though some think "that agricultural schools are not beneficial". Others believe that the agricultural school should be elementary but the committee is opposed to this plan. "This college of agriculture and the mechanic arts ought not to rival the primary schools, or grammar schools, or high schools, or district schools of the State. The true theory of education is that all the children and youth of the State should be educated together in the public schools of the Commonwealth, without any reference to the occupation of their parents, or to the occupation that they themselves intend to pursue, until they arrive at an age when it is proper for them to choose their own occupation." "The people would not tolerate a blacksmith's high school, clergyman's high school, or sailor's high school. "Why, then, a farmers' high school for the sons of farmers?"

"An agricultural school should be a professional school, or a college for young men * * * who desire to obtain a good education in the science and art of agriculture. Whatever pertains to agriculture should there be taught and whatever has no immediate connection with agriculture should not be taught. * * * Instruction should be given principally by lectures and by exhibitions of drawings, models and experiments to illustrate and confirm the truths presented. The instruction should be so systematized as to furnish aid alike to those who could afford to enjoy the advantages of the school but a short time, and to those who

could complete its full course of instruction. * * * There can be but one serious impediment in the way of making a true professional agricultural school in this State prosper, and that is a want of interest in it among the agricultural population." (249)

The Governor and other leading men favored an arrangement with Harvard College, the Institute of Technology and Zoological Museum, which in effect would create "a grand university." This would include use of the Bussey fund and farm for instruction and experiments. Objectors to these plans urged that agricultural experiments and instruction could be carried on better with less expense in a rural region. A committee of the Board of Agriculture, including Marshall P. Wilder and Dr. George B. Loring, afterwards United States Commissioner of Agriculture, were among the opponents. Others wanted the land-grant fund divided among the colleges of the State and there were petitions from Amherst and Williams Colleges on this basis. The joint committee however favored one or at most two institutions.

A subcommittee had visited and reported on the agricultural college of Pennsylvania. Their report evidently made a deep impression on the joint committee, who concluded that "a school like that can only succeed as a large school * * * wholly disconnected with all existing institutions and separate from all large cities and towns." (249) Otherwise manual labor, which the committee believed was a very important factor in an agricultural college, would be treated with contempt by the students.

The necessary funds "should be contributed equally by the State and individuals". The committee's report was accompanied with a bill granting 1/10 of the land-grant fund for the purchase of land for an agricultural college and of the remainder 1/3 for the Institute of Technology and 2/3 for an agricultural college under a separate board of trustees.

Acts were passed as follows: accepting the land-grant April 18, 1863; incorporating the agricultural college April 29, 1863; and dividing the land-grant fund as proposed by the committee, April 21, 1864.

A board of trustees was created consisting of thirteen members elected by the legislature for life and the governor, lieutenant-governor, secretaries of the boards of education and agriculture and the president of the college as members ex-officio. In practice one member was elected from each county. The location, plan of organization and course of study were originally made subject to the approval of the legislature but later of the governor and council. By an act of May 26, 1866, the board of agriculture was made a board of overseers, with advisory and visitorial powers.

The Board of Trustees was organized November 8, 1863 and set about securing funds for the college. The act relating to the land-grant provided that not less than \$75,000 must be raised by subscription or otherwise for buildings before 1/10 of the proceeds of the sale of the lands would be paid to the board. Funds had to be provided for live stock and other equipment, maintenance of the farm, and faculty. Under the terms of the land-grant act of 1862 the State was pledged to establish an agricultural college within five years after the passage of that act. The trustees therefore petitioned the legislature in 1864 to make the land-grant funds immediately available in order that they might locate the college. They also asked for further financial aid from the State.

Henry F. French, a lawyer and judge, who had been prominent in the agricultural affairs of the State, had written a book on drainage, and had recently visited agricultural institutions in Europe, was elected the first president of the college November 29, 1864 and served two years. His successor was Paul A. Chadbourne, instructor in natural sciences at Williams College. Ill health compelled his resignation after a few months. Then came the long time presidency of William S. Clark. He had been trained at Amherst College, including studies in

geology and mineralogy under Dr. Hitchcock, had studied chemistry and botany at Göttingen, Germany, and had made special botanical observations at the Kew Gardens at London. He had then been professor of chemistry, botany and zoology in Amherst College and a Colonel in the Civil War. As representative from Amherst in the legislature between 1864 and 1867 he had an important part in determining the location of the college.

The board of trustees considered the offers made by Northampton, Springfield, Lexington and Amherst and decided to locate the college at Amherst, that town having agreed to raise \$50,000 by taxation and \$25,000 by subscription.

The State of Massachusetts received 360,000 acres in scrip. On May 11, 1864, scrip for 36,000 acres was transferred to the Massachusetts Agricultural College to be used in purchasing a site for the college. The proceeds from the sale of this scrip amounted to \$29,778 and were used in part payment for the farm of 310 acres at Amherst, costing \$34,999. The remainder of the scrip was sold by the State from time to time. In 1868 the land-grant fund amounted to \$205,509 and the income to \$12,445, two-thirds of which was paid to the Agricultural College. In 1871 by fortunate reinvestments and state grants the endowment for technical education became \$350,000 and this was increased to \$360,000 in 1876. In 1882 the legislature divided this fund into a United States Grant roughly set at \$219,000 and a Commonwealth Grant aggregating \$141,575. The former was invested in bonds at 5 per cent, making the annual allotment of the Federal land-grant fund to the Agricultural College \$7,300. The college also received the income of the Commonwealth Grant.

The need of State aid for the maintenance of the college was early apparent. In an appeal to the legislature in 1864 the committee said -

"Were the whole scrip sold at 80 cents per acre and invested at 5%, the college would derive from it an annual income of \$8,600; less than $\frac{1}{2}$ the annual expenses of Dartmouth or Amherst College, about $\frac{1}{8}$ of the annual expenses of Yale and about $\frac{1}{17}$ of the annual expenses of Harvard."

The legislature granted the college \$10,000, provided that repayment would be made from the income of the land-scrip fund (but this was illegal) and by an act of May 11, 1865, \$10,000 outright.

In 1868 the legislature appropriated \$50,000 for buildings and the following year the same amount for buildings and other purposes. In 1877 the legislature gave \$5,000 for current expenses, one half to be used for paying student labor. In 1879 \$32,000 was appropriated to meet debts incurred during several years. In 1882, \$9,000 was granted for a drill hall and the next year a permanent appropriation of \$10,000 annually for current expenses was made. In 1884 \$36,000 was given for a chapel and library building and the next year \$45,000 for buildings and apparatus.

At the beginning all students were required to pay tuition, fixed at \$12 per term. This was soon increased to \$18 and in 1874 to \$25. Afterwards it was reduced to \$12 but in 1885 was raised to \$80 for the year. However, in the early years most of the agricultural societies paid the bills of one or more students. Free scholarships were from time to time provided by State appropriations and these increased in number until practically tuition was free to students from within the State.

The buildings erected when the college opened were a hall for class-rooms, library, museum and dormitory, a chemical laboratory, a botanic museum, and a boarding-house. The same year a fine group of glass plant houses was given to the college by Dr. Nathan Durfee and a fund of \$10,000 was provided by L. M. and H. F. Hills, the income of which was to be expended for seeds, plants, etc. In 1868 another dormitory was built, and the following year a barn costing \$9,000 was constructed and the chemical laboratory was extensively enlarged to provide a chapel, class-rooms and drill hall. In 1883 a separate drill hall was erected and two years later a chapel and library.

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In their report for 1866 the trustees set forth their view of the purpose and organization of the college. "Our first duty we apprehend to be, to make the college distinctively an agricultural institution, to establish a course of study, which if faithfully pursued shall make every graduate a scientific and practical farmer."

There must be also "the best discipline of the mind, physical training, esthetic and moral culture and military tactics. The college should have departments of agriculture and horticulture, physics, mathematics and engineering, natural history, chemistry, political economy, intellectual philosophy, and Christian morals, comparative anatomy and animal physiology (including veterinary surgery and medicine), modern languages and literature, and physical education, including military tactics. The applications of science to farm labor, roads, bridges, irrigation, drainage and surveying should be taught, as well as architecture. Special attention should be given to the training of teachers and to experiments and investigations to advance knowledge. Manual labor was to be required "primarily for the education of the student and not for profit." The student should "practice such labor as he does not understand." In addition to the regular long course there should be short courses and popular lectures. To lay out the farm and conduct its operations Levi Stockbridge, a farmer in the nearby town of Hadley, was elected farm superintendent.

The Board of Agriculture continued to show great interest in the college and in 1866 was made its board of overseers, whose duty it was to visit the college and advise on its affairs. It immediately decided to locate its cabinet and library at the college. In 1867 it urged the agricultural societies in the State to maintain scholarships at the college and in 1869 18 societies were doing this. It also provided for lectures at the college by its secretary and Charles L. Flint lectured four years on dairy farming. As a member of this board

Louis Agassiz for several years visited the college and in 1871 spoke at its first commencement.

Lecturers from outside, including Dr. Hitchcock and other members of the faculty of Amherst College, on different phases of literature, science and agriculture were employed and members of the faculty gave more or less instruction not included in the terms of their professorships. For example, Professor Goodell lectured on entomology in 1869 and was instructor in zoology, anatomy and physiology from 1869 to 1871. In 1869 Major Henry E. Alvord of the regular United States Army was detailed as military instructor. He was thus given an opportunity to study agriculture at the college and in 1885 became professor of agriculture there.

The college was opened October 2, 1867, and 47 students were in attendance during the first term. The faculty consisted of William S. Clark, president and professor of botany and horticulture, Levi Stockbridge, instructor in agriculture, Ebenezer Snell, professor of mathematics and Henry H. Goodell, professor of modern languages and instructor in gymnastics and military tactics. Charles A. Goessmann came in 1868 as professor of chemistry and the faculty was soon increased to 11 members.

In 1871 Selim H. Peabody, afterwards president of the University of Illinois, became professor of mathematics, physics and civil engineering, and in 1872 Henry James Clark became professor of comparative anatomy and veterinary science. He was a graduate of New York University and Lawrence Scientific School, a student and assistant under Agassiz, adjunct professor of zoology in Harvard College and a professor in the Pennsylvania Agricultural College and Kentucky University.

In 1874 Samuel T. Maynard, a graduate of the college in 1872, was elected gardener and assistant professor of horticulture and afterwards served for many years as professor of botany and horticulture.

In 1883 Dr. Manly Miles, who had been professor of agriculture in the Michigan Agricultural College and the University of Illinois, succeeded Professor Stockbridge as professor of agriculture at the Massachusetts College, and served in that capacity for three years.

In 1886 Dr. Charles H. Fernald came from the Maine State College to be professor of zoology and lecturer on veterinary science. That year the faculty included President Goodell and 8 professors, an associate professor and 2 lecturers.

Candidates for admission must be at least 15 years of age and were examined in English grammar, geography, arithmetic and history of the United States. From 1874 algebra to simple equations and afterwards to quadratics was required. The academic year began on the second Thursday of September and included three terms of thirteen weeks each.

The first course of study occupied 4 years and led to the degree of bachelor of science. It included in freshman year algebra, geometry, human anatomy and physiology, chemistry, botany, English, French; Sophomore year, commercial arithmetic, book-keeping, trigonometry, mensuration, surveying, chemistry, zoology, English, German and drawing and agriculture; Junior year, physics, agricultural chemistry, botany, astronomy, English, French or German, drawing, horticulture; Senior year, geology, political geography, civics, political economy, history, engineering, intellectual and moral philosophy. At different times during the course there were lectures from persons outside the resident faculty on crops, livestock, dairy farming, market gardening, landscape gardening, horticulture, forestry, rural law, entomology, diseases of animals, etc. Exercises in gymnastics, and military tactics were also required during the course.

By 1873 this course had been changed to include regular instruction in agriculture throughout the four years; chemistry in freshman and sophomore years; zoology and entomology in sophomore and junior years; botany in junior and senior years; veterinary science throughout senior year; French in freshman and sophomore years; German throughout junior year. Thereafter changes were made from time to time in the order in which the subjects were taught but the content of the course as a whole remained practically the same. In 1883 an attempt was made to have two general courses of study, (1) a scientific and agricultural course and (2) a scientific and literary course. The latter was "adapted to those whose previous practical knowledge of agriculture or whose choice of other employments than that of tilling the soil, requires less time shall be spent in field work." Two terms of Latin were offered in the literary course and French and German were taken out of the agricultural course. The annual reports of the college for succeeding years to 1887 show only one course which is substantially like that prior to 1883, but apparently students were allowed to elect Latin or modern languages to a certain extent.

All students were required to perform manual labor six hours a week without compensation and voluntary work for wages of from 10 to 15 cents per hour was also provided. The first senior class went on a strike because they thought the compulsory labor was not educational. Apparently thereafter greater efforts were made to relate manual work more definitely to the class-room work. Here, as elsewhere, there was much difficulty in working a satisfactory labor system and about 1883 compulsory labor ceased to be required uniformly of all students.

From the beginning special students were admitted to pursue certain studies either in connection with the regular classes or by special arrangement with individual instructors. The number of such students was relatively large during the early years of the college.

Graduate students were reported first in 1874. Their number ranged from 2 to 13 each year between 1874 and 1886. The total number of students was 147 in 1872, but declined until 1877 when there were 88. Increase in the number of free scholarships brought the number up to 141 in 1878. It went down again to 79 in 1883 and was only 110 in 1885.

The number of graduates began with 27 in 1871 but did not reach that level again until 1881 when there were 31. Otherwise up to 1886 the number fluctuated between 24 in 1872 and 1876, 7 in 1878 and 4 in 1884. The general catalogue of the college, 1862-1886, enumerates 237 graduates and 406 non-graduates, a total of 643. Of both graduates and non-graduates 175 engaged in agriculture and kindred pursuits, 221 in various forms of business, 25 were teachers, 18 were chemists, 7 were veterinarians, 22 were physicians, and 25 were engineers.

Much of the instruction was given through lectures but in the natural sciences a considerable amount of laboratory work by the students was developed. Practical observations and exercises in the field were employed to a certain extent, in addition to the routine manual labor of the students in agriculture and horticulture. Textbooks were also used. The following list of textbooks was recommended to students for recitation or reference in 1875:

Botany and Horticulture.

Gray's Lessons, Manual, and Botanical Text-book.

Master's Henfrey's Elementary Course of Botany.

Berkeley's Introduction to Cryptogamic Botany.

Cooke's Microscopic Fungi.

Carpenter's The Microscope and its Revelations.

Flint's Grasses and Forage Plants.

Downing's Fruits and Fruit-trees of America.

Thomas's American Fruit Culturist.

Strong's Grape Culture.

Henderson's Practical Floriculture.

Fuller's Forest Tree Culturist.

Hoope's Book of Evergreens.

Williams' Choice Stove and Greenhouse Plants.

Helmsley's Hand-book of Hardy Trees, Shrubs, and Herbaceous Plants.

Loudon's Cyclopaedia of Plants.

Lindley and Moore's Treasury of Botany.

Kemp's Landscape Gardening.

Downing's Landscape Gardening.

Agriculture.

Johnson's How Crops Grow.

Johnson's How Crops Feed.

Pendleton's Scientific Agriculture.

Hyde's Lowell Lectures on Agriculture.

Liebig's Natural Laws of Husbandry.

French's Farm Drainage.

Flint's Milch Cows and Dairy Farming.

Sturtevant's The Dairy Cow - Ayrshire.

Waring's Handy-book of Husbandry.

Henderson's Gardening for Profit. •

Donaldson's British Agriculture.

Morton's Cyclopaedia of Agriculture.

Low's Domesticated Animals.

Flint's Reports on the Agriculture of Massachusetts.

Agricultural Gazette and Gardeners' Chronicle, London.

Chemistry and Geology.

- Watt's Fownes' Manual of Elementary Chemistry.
- Sibson's Agricultural Chemistry.
- Caldwell's Agricultural Chemical Analysis.
- Nason's Woehler's Chemical Analysis.
- Will's Analytical Chemistry.
- Johnson's Fresenius' Qualitative and Quantitative Analysis.
- Liebig's Ernährung der Pflanzen.
- Wolff's Landwirthschaftliche Analyse.
- Hoffman's Ackerbau Chemie.
- Watt's Chemical Dictionary.
- Dana's Mineralogy.
- Hitchcock's Geology.
- Dana's Text-book and Manual of Geology.

Veterinary Science and Zoölogy.

- Fleming's Chauveau's Comparative Anatomy of Domesticated Animals.
- Dalton's Human Physiology.
- Cleland's Animal Physiology.
- Williams's Principles of Veterinary Surgery.
- Williams's Principles of Veterinary Medicine.
- Gamgee's on Horse-Shoeing and Lameness.
- Gamgee's Domestic Animals in Health and Disease.
- Armitage's Clater's Cattle Doctor.
- Youatt's Treatises on the Domestic Animals.
- Blaine's Veterinary Art.
- Morton's Manual of Pharmacy.
- Wood and Bache's United States Dispensatory.
- Harbison's Elementary Zoölogy.
- Lankester's Advanced Zoölogy.

Packard's Guide to the Study of Insects.

Harris' Insects Injurious to Vegetation.

Westwood's Principles of Classification of Insects.

Baird's Mammals of North America.

Murray's Geographical Distribution of Mammals.

Samuel's Birds of New England.

Cobbold's Entozoa.

Denney's Parasitic Insects.

Moquin-Tandon's Manual of Medical Zoology.

The conditions prevailing in the early years of the Massachusetts and other agricultural colleges as regards the instruction in agriculture are well set forth in the report of President Clark for 1869. The instruction of the students "in all the practical details of the farm, and of business connected therewith, as well as in the principles that underlie all intelligent, successful practice, devolve to great extent on the farm superintendent and professor of agriculture.

* * * * * In consequence of the crude and undigested condition of our agricultural knowledge, of the lack of suitable text-books, and a generally accepted system of agriculture, his duties should be so arranged as to give him the necessary time and freedom of thought for investigating and establishing agricultural facts, and to instruct his pupils individually in everything that relates to the most correct practice. In the present condition of the institution this officer is the "man of all work." A portion of the year he is daily in the school-room as a teacher, he lectures weekly, he must take his class to the farm daily for practice in the manual of agriculture. He must plan all general farm work and improvement, and personally superintend the carrying out of these plans, take charge of and keep the time of the paid labor of students and men, look to the condition of the stock and crops, have the general supervision of the teams and tools, and examine and

report on all implements and machines left for trial, must keep the farm books and accounts, attend to all the outside business of the farm, with his own hand perform such farm labor as requires skill and experience, and be ready at all times to give attention to the visiting public who seek for information respecting the agricultural department. It is therefore important that the duties now assigned to one individual should, as soon as circumstances will admit, be divided and assigned to two persons - a professor of agriculture and farm superintendent, whose duty it shall be to give instruction in agriculture in the lecture room and field, and to have the general direction and planning of all farm operations and improvements; and a farmer, intelligent, capable and efficient, who shall have the personal oversight of all the details of farm labor and keep the time of hired men and of students who work for pay, and be responsible to the superintendent for the discharge of his duties."

The following extract from Professor Stockbridge's report for 1873 illustrates the prevailing methods of instruction in agriculture:

"Our method of instruction in the theory of agriculture is by lectures, which are continued through more than three years of the college course, keeping the subject of agriculture prominently before the student much the largest portion of the time while he is connected with the institution. These lectures are conversational in manner and are intended to give a thorough knowledge of the fundamental principles which are the basis of all correct, rational practice in the management of soils, and the production of plants and animals, and to qualify the student to engage in agriculture, or the pursuits related thereto, as a personal vocation, with intelligent satisfaction and success, or to judiciously superintend and direct agricultural operations. The entire course is systematically arranged by topics, commencing with "The Importance of Agriculture as an Occupation, and its Influence on Private and Public Welfare and Improvement." This is followed by an exposition of the application and practical value to agriculture of scientific knowledge. Our next study is the soil, its origin, the causes which produced it, its composition, the offices of its different kinds of matter and their influence on each other. Then we consider the effect on the soil of cold or frost, of heat, of air, and of water. This is followed by an examination of the chemical and physical condition and changes of soil. This leads to the plant, as a general topic, which is examined from an agricultural rather than a botanical standpoint. It is considered with respect to its characteristics and composition, its susceptibility to modification and improvement by culture, its organs and their offices, how it is influenced by temperature, air, water, soil and food. Next we inquire concerning the effect on the soil of producing plants, naturally and artificially; what in each case are the results, and why; followed by an explanation

of the various methods of culture and crop-rotation which may be resorted to to sustain its producing power. Then follows the subject of manures, which we consider in relation to their influence on the soil and plant, their kinds, quality, general and special adaptations. Then we examine the advantages and disadvantages of different branches of agriculture, as a vocation, general and special farming, selection of a location for each; regard being had to individual taste, soil, climate and markets. We divide and arrange the farm, locate and construct its buildings, adopt a yearly and a life system or plan, arrange the kind and rotation of crops adapted to its varieties of soil, and go through in detail a year of routine management of land, crops and stock. Then farm economy and accounts are considered, followed by domestic animals, stock-husbandry and everything related thereto, market-gardening in all its departments, forests and forest culture, and fruit culture. To avoid some of the real objections which exist to oral teaching, constant effort is made to secure on the part of the student such a record of instruction given that it may be permanently retained, and at any time be made the basis of review and examination. To make this instruction more effective and useful, in certain parts of our course, it is extremely desirable that large additions be made to our very small agricultural cabinet. We need for illustration in the lecture room, when considering the subject of implements of tillage and pulverization, a collection of farm-implements of the most ancient and modern manufacture,--models which shall show the principles of their construction and the various types of progress in the several departments, and embody the best ideas of the best farmers and mechanics of modern times. It is also very desirable that in the department of labor saving machinery for the farm we shall be supplied with models to enable the teacher to present clearly the object of their construction and use, the principles involved, and to direct attention to desirable improvements. Though the college now possesses specimens of nearly all the improved breeds of cattle, which are freely used in the course of stock-husbandry, principles of breeding and the improvement of cattle, yet we need a large collection of diagrams, paintings, and sketches, which can be quickly and easily used by the lecturer to display the comparative faults and excellence of different breeds and kinds of domestic animals, the various stages of change and development from the original type to present forms and qualities, and to show minutely the points which it is the desire of the breeder to obtain. The use of such diagrams would greatly enhance the value of the instruction given and more than compensate the cost.

These suggestions respecting the wants of the agricultural department are intended to apply to its present needs and somewhat straightened circumstances; but I most sincerely hope the day is not far distant when it will have assigned to its special use a suite of apartments consisting of a lecture room, suitably furnished with appropriate emblems and diagrams, and, adjoining, cabinet and museum rooms, supplied with everything needed to make the instruction of the professor of agriculture as interesting and useful as possible." (242)

When the agricultural college was established there was much objection in Massachusetts to the support of higher education by the State and in 1870 a determined effort was made to stop all further grants of State funds to this college. A resolution adopted by the House of Representatives directed the Secretaries of the boards of Education and Agriculture "to devise a plan, if practicable, by which the

the College may without expense to the Commonwealth be recognized as an independent institution in analogy with other colleges in the Commonwealth and that they inquire whether the term of study in said college should not be reduced."

In 1871 the first class, having 27 members, was graduated. At the graduating exercises Senator Morrill and Marshall P. Wilder delivered addresses. Boating was then the leading form of athletics in the New England colleges and there was great excitement in college circles when the "Aggies" won their race with Harvard and made a record for a three mile race. This event did much to give the agricultural college standing as a real college. That year the legislature gave the college an appropriation of \$50,000 for its debts and other expenses and the permanent endowment fund was increased to \$350,000.

Prizes to students for achievement in agriculture, botany, entomology and rhetoric were established in 1873 through gifts by friends of the college. For the best oral and written examinations in the theory and practice of agriculture prizes were to be awarded each year to two members of the graduating class.

"During the year 1875 the college trustees entered into an important agreement with the corporation of Boston University, whereby they agreed on behalf of the college that matriculants in the university desiring to pursue any regular or special course in instruction presented at the Agricultural College, should be at liberty to do so on the same terms and conditions as other persons, and on completing the course to the satisfaction of the authorities of both institutions, should be entitled to the appropriate degree, either from the college or the university, or from both, as they might prefer. Under this agreement a student at the college might become a member of the university and receive its diploma in addition to that of the college, and many of the students have done this."(226)

President Clark went to Japan in 1876 at the invitation of the imperial government to organize the Sapporo Agricultural College and took with him several graduates of the Massachusetts College to be professors in this new college. Among these was William Penn Brooks of the class of 1875, who served as professor of agriculture until October, 1888, when he returned to the Massachusetts Agricultural College to hold a similar position for many years.

In 1879 President Clark resigned the presidency of the Massachusetts College. The college then entered on a period of difficulty and uncertainty regarding its future. "On April 24th the Legislature passed an act granting thirty-two thousand dollars to the college to pay existing indebtedness, and at the same time made the trustees personally responsible for any debt thereafter incurred in excess of the income of the college. June 12th the trustees, owing to the diminished income, sold at auction all the blooded stock belonging to the college, except the Ayrshire herd. Current expenses were reduced ten thousand dollars a year; one professorship was abolished; the president's salary was withheld; and the salaries of the professors and treasurer were cut down."

"An act passed by the Legislature in 1879 constituted the governor and council a commission to examine the status of the institution with the intention of severing its connection with and releasing the state from its obligation and guarantees to the general government respecting the college. This committee submitted its report to the Legislature in 1880, practically recommending that the college with its real and personal estate and the trust funds received from the United States for its specific support, should be given to Amherst College, and that any further effort toward its maintenance by the state should be abandoned. This proposition, although strongly advocated by Governor Long, was so radical and so subversive of the integrity of the state, that it gained no favor at the hands of the public and no effort was made by the Legislature to accept this report. This attempt by those opposed to the college to destroy its independence as an Agricultural College, seemed to attract to the college the sympathy and support of the agricultural community and the friends of agricultural education." (226)

In this crisis for about a year Charles L. Flint, long time secretary of the State Board of Agriculture and of the Board of Trustees of the College, served as president without pay. From 1880 to 1882 Levi Stockbridge was president and then

Paul A. Chadbourne was for a short time president for a second term and died in that office. His successor in 1883 was James Carruthers Greenough, a graduate of Williams College and principal of the Rhode Island Normal School. By that time confidence in the usefulness of the college as a State institution had been restored and under his administration considerable appropriations for new buildings and extensive repairs and improvements in old buildings were made, the standard of scholarship was raised and the course of study was extended.

"In 1883 the Legislature passed a resolve. 'That there shall be paid annually from the treasury of the commonwealth to the treasurer of the Massachusetts Agricultural College at Amherst, the sum of ten thousand dollars, to enable the trustees of said college to provide for the students of said institution the theoretical and practical education required by its charter and the law of the United States relating thereto.' Eighty three scholarships were also established, two for each senatorial district, the candidates to be recommended by the senator of the district." (226)

In 1886 Henry H. Goodell, who had served as professor of modern languages and in other capacities from the beginning of the college was elected president and continued in that office until his death in 1905. During his term the college was greatly strengthened and had a much broader influence as an institution for higher education in science and agriculture.

Experimental work was begun on the college farm by Professor Stockbridge as soon as the college was established. The early experiments with fertilizers led to the issuing in 1876 of his special formulas for commercial fertilizers which were widely used. The first money which he obtained for royalties was used for experiments at Amherst and laid the foundation for an Experiment Station there. Among other experiments made by him were those on the "dust mulch", the sources of soil moisture and the origin of dew. President Clark's experiments on the circulation of sap in the sugar maple and other species of trees and with the

"squash in harness" to determine the expansive force of a growing plant attracted much attention. Soon after Professor Goessman came to the college he began investigations on the culture of sugar beets and the manufacture of beet sugar, the results of which were published in four important papers between 1871 and 1879. Among his other early investigations were those on the utilization of salt marshes, the relative value of several varieties of corn for feeding purposes, the value of early amber sorghum as a sugar producing plant, and the chemistry of fruit culture. His report on commercial fertilizers, including his own analyses of those in the local market, was largely instrumental in bringing about the first law in the United States requiring an official inspection of fertilizers. This was passed May 26, 1873, and Professor Goessmann as chemist of the State Board of Agriculture became the State inspector of fertilizers. In 1878 when Professor Stockbridge's gift of \$1,000 became available the organization of an experiment station at the college was attempted but lack of funds prevented its continuance until by a State Act of May 12, 1882, the Massachusetts Agricultural Experiment Station was established. Dr. Goessmann was made its director and chemist. This station was independent of the college in its organization and management but was located on the college ground and under a nominal lease used college land and buildings. Plans were immediately made for field and feeding experiments and for chemical work. Analyses of fertilizers, forage plants, feeding stuffs, milk and other dairy products, drinking waters, etc., were made for farmers and others. The experimental work at the college was enlarged to include field and feeding experiments with legumes and other forage plants for soiling, feeding experiments with milch cows, and with pigs. The list of experiments carried on from 1870 to 1884 published in the annual report of the college

for 1884 shows quite a range of work. Thus the way was prepared for the larger development of experiment station work under Federal and State laws.

In Massachusetts extension work was carried through annual "country meetings" of the State Board of Agriculture beginning with 1863 and through meetings of the county and local agricultural societies. In December, 1868, the country meeting of the board, which resembled a farmers' institute, was held at Amherst. Among the speakers at this meeting was Louis Agassiz. He was also chairman of a committee of the board, who attended examinations of students and inspected the operations of the college. A few months before this the New England Agricultural Society had held a trial of plows at the college. From 1878 the societies held farmers' institutes under the direction of the State Board. Members of the faculty of the Massachusetts Agricultural College participated to a certain extent in these meetings of the State board and the societies. Information regarding the experimental work at the college was also disseminated through the annual reports of the college and the agricultural and other press.

Through the experimental and other activities of its small but efficient faculty the Massachusetts Agricultural College exerted a considerable and wide influence on the development of agricultural education and research in this country. The number of its students was not large during the first 20 years of its operation and only a small share of these devoted themselves to agricultural careers. The graduates of this college during this period who became teachers, investigators or administrative officers in agricultural institutions in different parts of the country, did much useful work in the promotion of the agricultural interests of the nation. This college gave at this time relatively strong instruction in languages, mathematics, chemistry, botany and zoology and coupled this with definite teaching of the relations of the natural sciences to agriculture and horticulture and of the practices of these arts.

Iowa State Agricultural College

In 1848 the Iowa legislature asked Congress to grant to the State, the site and buildings of Fort Atkinson in Winneshiek County, with two sections of land, for an agricultural college. Nothing came of this movement but on December 28, 1853, the State Agricultural Society was organized by people interested in Agricultural Education and the following year Governor James W. Grimes favored the establishment of a State school of applied science. Petitions for an agricultural college multiplied and finally on March 22, 1858, Governor Lowe approved a bill for a State Agricultural College and Farm.

This act carried an appropriation of \$10,000 and put the management of the college under a board of trustees of 11 members, one for each judicial district. The board held its first meeting December 10, 1859, and issued a notice for the purchase of land for the college. Proposals were received from six counties. The farm selected is located in Story County, near the village of Ames. It contains 648 acres and cost \$5,374. "Story County voted \$10,000 of county bonds and subscribed \$4,320 in individual notes. Boone and Story counties together gave 861 acres of land valued at \$6,015 and their subscriptions, together with the appropriation of \$10,000 by the state, amounted to \$31,355. The five sections of land in Jasper County, comprising 3,200 acres and granted to the state by the federal government for the erection of capitol buildings, were diverted with the consent of Congress, to the use and benefit of the College." (190) ^ The bad financial conditions of the State and the coming on of the Civil War prevented further State appropriations for several years. In 1860 an attempt was made in the legislature to repeal the act establishing the college.

Iowa was the first State to accept the provisions of the Morrill land-grant act. This was done on September 11, 1862 by the legislature in special session. The State thus became entitled to 240,000 acres of Federal land.

A competent agent was appointed by the Governor to locate the lands, which were immediately approved and certified to the State.

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The selected areas embraced some of the best unentered lands in the State. Peter Melendy, the locating agent, selected in the first lot about 50,000 acres of maximum value near the Dubuque and Sioux City Railroad and the Cedar Rapids and Missouri River Railroad. Excellent judgment was shown in this choice. Melendy located in all some 195,000 acres, which in adjustment and remeasurement, were confirmed by the United States Land Office at 204,309 acres.

These lands were leased at about 8 per cent on an appraised valuation of \$1.50 to \$3.00 per acre. This gave at once a satisfactory income to the Iowa Agricultural College. The college financial agent managed the grant so well that, through buying, selling and renting the lands, investing and reinvesting the income, on June 30, 1914 the principal amounted to \$686,817.97 and the income accruing to the college was \$35,191.86.

In 1864 "An earnest effort was made to divert these lands from the Agricultural College, and to use them to increase the endowment of the State University, upon the condition that a department of agriculture should be established, an experimental farm be purchased, and an agricultural course in the university be provided for such as wished to pursue it. It was urged, as it has been elsewhere, that by adopting this course there would be a large saving in the expense of buildings, professors, cabinets, librarians, &c., and that in no other way could desirable and necessary funds for the university be so easily procured. The friends of the Agricultural College resisted this attempt to divert the grant from its original purpose, contending that it belonged to it from the terms of the act of Congress; that the industrial classes comprised the majority of the people and tax-payers of the State, and they desired to build up an institution that should be devoted to their interests. After an able and earnest discussion of the subject the entire grant was given forever to the Agricultural College." (189)

The board of trustees as constituted in 1865 included the Governor and president of the State Agricultural Society as ex-officio members, in addition to those appointed from the judicial districts. The erection of the first college building was then begun, for which the legislature appropriated \$20,000 in 1864 and \$91,000 in 1866. For small buildings, farm expenses, etc. \$47,750 was appropriated in 1868 and in 1870 an additional amount of \$68,500 of which \$50,000 was for extending the original college building, \$5,000 for a chemical

and physical laboratory, \$5,000 for a workshop and \$4,500 for professors' houses.

This main college building was to have sufficient accommodations for the board and lodgment and tuition of 200 students, and the required number of professors. The structure was 5 stories high, 156 feet long and 70 feet wide. The wings were capable of extension to meet any future demands for space. The equipment of the college was gradually increased and in 1886, besides the original building, there were on the campus, special buildings for chemistry and physics, agriculture, zoology and botany, horticulture, domestic economy, veterinary medicine, engineering, and administration, together with a workshop, creamery, two barns and six dwellings. The farm had been enlarged to 900 acres.

In connection with the determination of the faculty and new course of study, a committee consisting of Governor Stone, Lieutenant Governor Gue and Peter Melendy, President of the State Agricultural Society, were appointed to visit the agricultural and other scientific and industrial institutions of other States, inquire into their operation and nominate a president and faculty for the Iowa college.

The course of instruction was provided for in the organic law creating the college, as follows:

"The course of instruction in said college shall include the following branches, to wit: natural philosophy, chemistry, botany, horticulture, fruit growing, forestry, animal and vegetable anatomy, geology, mineralogy, meteorology, entomology, zoology, the veterinary art, plain mensuration, leveling, surveying, book keeping, and such mechanic arts as are directly connected with agriculture. Also, such other studies as the trustees may from time to time prescribe, not inconsistent with the purposes of this act."

The board of trustees was also given the right to establish professorships.

Tuition in the college was to be forever free to pupils from the State who were over 14 years of age and who had been residents of the State for six months previous to their admission. The law also provided that:

"Applicants for admission must be of good moral character, able to read and write the English language with correctness, and also to pass a satisfactory examination in the fundamental rules of arithmetic."

By 1883 the minimum age of admission had been raised to 16 years and the scholastic requirements for admission to the freshman class included English grammar and analysis, arithmetic, human physiology, and algebra through simple equations. Preparatory or subfreshman classes were maintained until 1887.

The trustees were given authority to establish rules regulating the number of hours, to be not less than two in winter and three in summer, which shall be devoted by the students to manual labor, and the compensation therefore, and no student was to be exempted from such service except in cases of sickness or infirmity. At first this meant chiefly ordinary labor on the farm or in the erection, repair or care of buildings. But later an effort was made for a number of years to distinguish between instructive and uninformative labor. Gradually the latter was reduced and from 1884 was no longer required. Work in the laboratories or in the field was thereafter more closely related to the plan of instruction in the several scientific and technical departments.

(1866)

In the first annual report of the Superintendent and secretary of the college to the legislature the aims of the institution are described as follows:

"OBJECTS OF THE INSTITUTION. The Iowa State Agricultural College has for its object, to associate a high state of intelligence with the practice of agriculture and the industrial or mechanic arts, and to seek to make use of this intelligence in developing the agricultural resources of the country and protecting its interests. It proposes to do this by several means:

1. As a purely educational institution, its course of instruction is to include the entire range of natural sciences, but will embrace more especially a practical bearing upon the everyday duties of life, in order to make the student familiar with the things immediately around him, and with the powers of nature he employs, and with the material through the instrumentality of which, under the blessing of Providence, he lives and has his being; and since agriculture does this, more than any other of the industrial arts, it follows that this should receive by far the highest degree of attention. The course of instruction is to be thorough, so that it will not only afford the student the facts of science, but will discipline his mind to habits of thought and enable him fully to comprehend the abstract principles involved in the practical operations of life. In doing this, it is not deemed possible to educate every agriculturist, artisan, mechanic, and business man in the State, but to send out a few students educated in the college courses, that they by the influence of precept and example, may infuse new life and intelligence into the several communities they may enter. A single individual who is thoroughly educated in the principles and practice of an art followed by a

community, will often exert a more salutary influence upon the practice of this art by the community, than would result from sending the whole community to a school of lower order than that which he attended. A single practical school of the highest order in Paris (the Ecole Polytechnique), during the last generation, made France a nation celebrated alike for profound philosophers, great statesmen, able generals and military men, and civil engineers. If one high school of practical character is established, subordinate schools affording the elementary education of the latter will follow in due time.

2. As a practical education, the trustees of the Iowa Agricultural College have adopted the fundamental principle, that whatever is necessary for man to have done, it is honorable for man to do, and that the grades of honor attached to all labor are dependent upon the talent and fidelity exhibited in performing it. It is further considered essential as a part of the student's education that he be taught the practical application, in the field and laboratory, of the principles of his studies in the class-room; and manual labor is also necessary for the preservation of health, and the maintenance of the habits of industry. An incidental but not unimportant result of the operations of these principles is a reduction of the cost of tuition by the value of the labor, so that the college can take students at very low rates of admission.

All students, without regard to pecuniary circumstances, are, therefore, obliged to perform manual labor as an essential part of the college education, and discipline and training. In these respects consists a most essential difference between the idea associated with manual labor and that of all other attempts made heretofore to combine manual labor with study. Instead of the idea of poverty and want being associated with those who labor, that of laziness and worthlessness is associated with those who refuse to work efficiently, and the experience of established institutions has already, most assuredly, shown that no young man of whom there is any hope for future usefulness in life is insensible to the disgrace which this attaches to the lazy, who will work only as they are watched, and cheat their fellow students by refusing to do their share of the labor assigned them; and nothing is more conclusively settled than that those students who are most studious and industrious in class, work the most efficiently, and are the most trustworthy in the performance of their daily work.

3. As an experimental institution, our college has an unbounded field for labor. The principles of agricultural science, which shall ultimately constitute the subject of instruction in its class-rooms, will be a prominent and important branch of it. The development of no other department will yield richer and more lasting results, or confer more substantial benefit upon agricultural practice than this. Much time, however, is required to make thorough and reliable experiments - they will not pay at once. As well might the farmer expect to reap his crop the day after he sows his grain. They will, however, ultimately pay a thousand-fold, as have the practical application of the sciences of electricity, heat and optics, in the present day, paid for the half century of apparently impractical, purely scientific investigations that led to the results now obtained through them.

The design of this institution is different from all other educational institutions in the country, excepting one in Pennsylvania and one in Michigan, now in successful operation. By the union of labor and study they are both placed in their proper position, and thus only are exhibited in their true dignity. Here they are taught to walk together, and that separation is degrading to both. The student's mind and hands are first prepared to promote skill and success in the important and honorable occupation of cultivating the soil, but he will be almost

equally fitted to fill with honor any other position in life. There is thus supplied a practical and equal education, so much needed by the great body of our farmers, and cheap enough to be embraced by all. "The farmer who claims such an equal education for his son, feels an imperative necessity for an institution such as this. He sees that the son of a farmer who has been in four years' course at our colleges returns with his eyes and his thoughts and the best of his mind directed away from the objects which worthily and usefully occupy his father and his brothers. He is useless and inferior in the sphere of his home; he cannot labor; he must go from home; he is driven from it; he can do nothing but enter a profession, and in any profession he may enter, if he cannot make a conspicuous mark, he is a miserable thing at best, and almost certain to fall into ruinous habits and to become their victim. And the unhappy and disappointed father loses not only the cost of his education, his own struggles and expended energy, but in three cases out of four the son himself. How different the case in circumstances which such an institution as ours is destined to establish! The boy, in great part, aids to work out his own education. Instead of dragging on his father, he aids him; instead of wasting his physical abilities, through want of exercise, he labors and develops them; while his mind is being restored with both practical and refining knowledge, his hands are educated to expertness in a thousand operations, and his body to grace and strength. How delightful will be the meeting between the graduate of our agricultural school and his father and brothers! He has stores of information for them, and there is a mutual interest and subjects of conversation and everything around. The proud and gratified father will bless the means by which his highest wishes have been accomplished.' So plain is the need of this course of training even to the dullest mind, and so plain is the method of establishing it, it is wonderful up to this day that such schools are only commencing in this country." (190)

Iowa Agricultural College and Farm formally opened for the admission of students on March 17, 1869. The first year 253 students were enrolled.. Adonijah Strong Welch was the first president and held that office from 1868 until 1883. He was a native of Connecticut and a graduate of the University of Michigan and had been principal of the Michigan State Normal School at Ypsilanti and President of the Michigan State Teachers Association. He was greatly interested in agriculture, especially animal breeding, and being an attractive speaker was often called upon to address farmers' meetings. Prof. I. P. Roberts described the president as follows:

"President A. S. Welch was a keen, cultivated gentleman, of very pleasant manners, patient under defeat and usually able to turn defeat into victory, That he successfully built an excellent college out on the lonely, wind-swept prairies by the track of an uncompleted railroad, marks him as a great organizer. That he was able to govern and mould that mass of crude boys and girls and inexperienced professors - picked up at almost random, as they had to be - into an efficient educational institution, proves him a man of rare executive ability." (415)

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Only two courses were offered at first, one in agriculture and the other in the mechanic arts or engineering. Women were permitted to enter either course.

The agricultural faculty consisted of Dr. Norton S. Townshend, Professor of Agriculture and Horticulture and President Welch who lectured on landscape gardening, and the second year on farm animals. In 1870 this faculty consisted of James Mathews, Professor of Pomology and Charles E. Bessey, Instructor in Botany and Horticulture (vegetable gardening), while the duties of the vacant professorship in agriculture were delegated to Professor Mathews, President Welch and Isaac P. Roberts who came to Ames as farm superintendent in 1869. The next year Mr. Roberts was made Professor of Practical Agriculture and "did much to give impetus, tone and real scientific and practical value to agricultural teaching in the Iowa Agricultural College." (194)

Though the requirements for admission to the college were at first necessarily low, much preparatory instruction was given. The first year there were 59 men and 21 women in the preparatory classes as compared with 97 men and 76 women in the freshman class.

The college year began in February and closed the end of October following. A few days of vacation were given in July. The winter vacation permitted the students to go out and teach and also made unnecessary the heating of the college building which was an expensive undertaking.

In 1870 the purpose of the college was stated to be "to make proficient in the sciences which underlie the various branches of industry and by manual labor to produce experts in all its various applications to the operations of the garden, farm, and workshop."

In 1871 the college faculty included 13 professors and assistants and the student body had 220 members. Of these 147 were in the freshman class, 40 in the sophomore class and 33 in the junior class. Agricultural students were not differentiated until sophomore year when there were 18 and the same number in

junior year. The following year there were 265 students and a class of 26 was graduated, of whom 17 were in the agricultural courses, 8 in mechanic arts and 1 in the women's course.

No agriculture was taught in freshman year but there was instruction in physics and physiology. The sophomores had physics, chemistry, zoology, botany and horticulture, with lectures in stock-breeding and farm engineering. The Juniors had agricultural chemistry, entomology, vegetable physiology, orchard culture, landscape gardening and farm engineering. The Seniors had mineralogy, geology, comparative anatomy and physiology, meteorology, cultivation and rotation of crops, fruit culture, forestry, management of stock, veterinary science and practice, and political economy. The horticultural course was somewhat different in senior year and there was a special nursery course running through sophomore, junior and senior years. Manual labor was required for $2\frac{1}{2}$ hours each day. For farm labor, students were paid 3 to 9 cents per hour and for labor in horticulture 3 to 7 cents.

Professor Roberts described the method of teaching agriculture at the Iowa College as follows:-

"I began to tell the students what I knew about farming. It did not take me long to run short of material and then I began to consult the library. I might as well look for cranberries on the Rocky Mountains as for material for teaching agriculture in that library. Thus, fortunately, I was driven to take the class to the field and farm, there to study plants, animals and tillage at first hand. * * * * I fell into the habit of taking the students to view good and poor farms; to see fine herds and scrub herds in the country round about, even though they had to travel in freight cars. I suppose I was the first teacher of agriculture to make use, in a large way, of the fields and the stables of the countryside as laboratories. * * * * One day, being short of lecture material, I went to the fields and gathered a great armful of the common weed pests. Handing them around to the class I asked for the common and the botanical names, and the methods of eradication. * * * * This experiment provided material for a week's classroom talk and led me to place still more emphasis on field laboratory work - 'walks and talks' - we called them." (415)

Finding the horse books in the library out of date, he dug up the remains of horses which had died of an epidemic in the neighborhood and with these specimens taught students "the fundamental principles of horse dentition."

There was one graduate student in 1873 and in 1876 authority was given the college to grant advanced degrees. The first of these degrees was given the next year to J. C. Arthur, afterwards for a long time botanist and investigator of plant diseases at Purdue University in Indiana.

On the resignation of Professor Roberts in 1873, to be become professor of agriculture at Cornell University, Miliken Stalker was appointed superintendent of the farm and Assistant Professor of Agriculture. Three years later in 1876 he was promoted to the chair of Agriculture and Veterinary Science. During 1875 G. E. Morrow had been appointed Professor of Agriculture, but in 1876 he resigned to accept a similar position in the Illinois Industrial University at Champaign.

In 1877 Agriculture and Veterinary Science were separated into two distinct departments and two years later a School of Veterinary Science was established. Dr. Stalker was given Veterinary Science and Seaman A. Knapp was appointed Professor of Practical and Experimental Agriculture. In 1877 J. L. Budd came to the College as Professor of Horticulture and Forestry.

"The drift of this and other land-grant colleges toward becoming mainly scientific institutions is shown in a paper on 'The true work of national industrial schools', which was read by President Welch at a meeting of presidents of State Universities and Agricultural Colleges in the West at Chicago, November 23, 1877. It is a plea for having these colleges educate specialists in the sciences relating to agriculture and other industries and is reported to have been approved unanimously by the convention. A course in industrial sciences was developed at the Iowa College and for a considerable period this was the most prominent feature of the institution. At first this amounted to an elective system by which juniors and seniors might specialize in particular sciences." The following is quoted from

an Historical Sketch, issued for the Semi-Centennial Celebration of the College,
June 6-9, 1920:

"Prior to 1882 only 6 percent of the men then living who had graduated from the College became identified with either practical farming or professional agriculture while nearly 40 percent entered law, medicine or the ministry, 17 percent engaged in teaching or similar professional work, 3 percent became veterinarians and only 9 percent engineers or mechanics. The dreams of the founders of the institution for a college which would send its graduates into the industries had not yet been realized.

The pressure for better recognition of agriculture resulted in giving marked emphasis to that major line of work by conferring the degree of Bachelor of Scientific Agriculture on students completing this course. Three men received this degree in 1883, which was the first year it was conferred at this institution. During the next few years a considerable number of men graduated with the B. S. A. degree and in later years nearly every one of them achieved positions of honor and influence in professional or practical work along agricultural or horticultural lines." (194)

The renewed interest in agriculture was shown by the organization of agricultural clubs in the college and by the issuing of a monthly bulletin, called the Students' Farm Journal.

In 1879 the college was divided into Schools of Agriculture, Horticulture, Veterinary Science, Domestic Economy, Literature and Language, Mathematics and Physics, Chemistry, Biology, Philosophy, Mechanical Engineering and Architecture, and Civil Engineering. And it was announced that students may pursue exclusively the studies of any single school. But the next year this organization was modified so as to include only the Course in Sciences related to the Industries and Schools of Agriculture, Engineering and Veterinary Science. In 1883 the college had 319 students of whom 69 were women. Nine were in the Veterinary School and 48 in the subfreshman class. That year President Welch, who had been sent by the United States Commissioner of Agriculture to study Agricultural Schools in Europe, was removed from the presidency but continued to serve as professor of psychology. Professor Knapp succeeded him as president of the college.

At that time there were 13 professors, assistants in zoology and entomology and chemistry, an instructor in mathematics and book-keeping, a preceptress, a

lecturer on domestic economy, a teacher in the workshop and a teacher of instrumental and vocal music. The agricultural faculty consisted of professors of practical and experimental agriculture, horticulture and veterinary science. In 1885 it was reported that only 1/5 of the students had the intention of becoming farmers. In 1887 the student body included 219 men and 74 women. The graduates numbered 39, divided as follows: science, 11; agriculture, 5; mechanical engineering, 2; civil engineering, 6; veterinary science, 12; ladies' course 3. The smallest number of graduates was 15 in 1873. The total number of graduates from the opening of the college to 1887 was 386. The occupations chosen by the members of the graduating class of 1887 were veterinary medicine 12, agriculture 9, civil engineering 6, mechanical engineering 3, practical chemistry 2, pharmacy 1, dentistry 1, business 1, law 3, teaching 3, medicine 1. In 1885 President Knapp was relieved of the presidency and in 1886 also retired from the professorship of agriculture. Leigh S. J. Hunt was president in 1885-86 but was compelled to resign on account of ill health. William I. Chamberlain who had been secretary of the Ohio State Board of Agriculture was president from July 1886 to 1890.

From 1883 to 1890 there was a marked falling off in enthusiasm and in efficiency. It was a period of administrative instability. The total enrollment declined, the agricultural clubs disappeared, and the Students Farm Journal was discontinued.

Experimental work on the college farm was begun as soon as the institution was established. In 1870 there was a special item of \$500 in the budget for seeds and plants for experiments and the next year there was a report on tests of varieties of wheat, rye, and oats. Experimental orchards of apples and other fruits and plantations of small fruits and vegetables were established. By 1880 about 40 acres were devoted to field experiments. That year \$600 was allotted for such work and \$800 in 1881, when the experiments included the cereals, potatoes,

and green manuring. Analyses of grasses and studies of rusts and other blights of grain were made. In 1883 Professor Knapp reported experiments with different methods of setting milk for cream, a milk record of cows, feeding experiments with calves and colts, field experiments with wheat, oats, corn, millet, soy beans, potatoes, grasses, durability of different kinds of wood for posts, sorghum for syrup and sugar, etc. In 1885 the annual appropriation for experiments was \$1,500 equally divided between agriculture and horticulture.

The policy of disseminating information by means of lectures and demonstrations was early established. Farmers' Institutes at Cedar Falls, Council Bluffs, Muscatine and Washington were conducted during the winter of 1870-71. Extension work of this character was gradually strengthened and enlarged. In 1863 a report was made on a series of lectures on domestic science given to a class of 60 in Des Moines. In 1887 funds were set aside by the State Agricultural Society to encourage institutes and a sum of \$150 became available for expenses of faculty members who attended such institutes.

Alabama Agricultural and Mechanical College (Polytechnic Institute)

The Alabama Polytechnic Institute had its origin in the East Alabama College, which was established by the Alabama Conference of the Methodist Episcopal Church, South, and opened for students October 1, 1859, "with a faculty composed of some of the ablest and best known Southern educators. It was well equipped for a classical college, with apparatus and appliances, and had a prosperous career until it suspended in 1862. In 1866 it was reopened and was in operation with a full
(119)
faculty and respectable patronage" in 1872.

"The State Legislature, by an act approved February 26, 1872, accepted an offer of the Alabama Conference of the Methodist Episcopal Church, South, donating to the State the college building, apparatus and good will of the East Alabama Male College, and located the Agricultural and Mechanical College at Auburn." (119)

Conditions due to reconstruction after the Civil War caused Alabama to delay acceptance of the Morrill land-grant act until December 31, 1868. The State then received scrip for 240,000 acres of land, which was sold during the next three years by a commission for 90 cents per acre, thus creating a fund of \$216,000. This was invested in Alabama State bonds at 85 cents on the dollar, giving the fund a face value of \$253,500 with interest at 8 per cent. Up to 1879 the interest was paid in Alabama State certificates and afterwards in currency. From this source the college has had an annual income of \$20,280. However, the State paid only \$2,560 "of the first installment of interest due the college and a large debt was incurred the first year, which severely hampered (119) the work of the institution for several years." Moreover, for some time the interest was paid in depreciated certificates. The first state appropriation for the college was made under an act of February 28, 1883. This amounted to \$30,000 for buildings, equipment and an experiment farm. In 1885 a second appropriation of \$12,500 was made by the legislature to establish a department of Mechanic Arts.

The college had only one substantial building until 1884 when an audience hall and a mechanic arts laboratory were erected. In 1886 a building for the forge and foundry departments was added. On June 24, 1887, the main building with all its contents was burned. With the insurance and a state appropriation of \$50,000 a new building was erected, together with a chemical laboratory.

The Agricultural and Mechanical College was organized by the new Board of Trustees March 22, 1872. Its first faculty included the members of the old faculty, two new professors and a commandant. Rev. L. T. Tichenor was president and professor of moral philosophy. There were seven other professors, including W. C. Stubbs, professor of chemistry, geology and mineralogy and W. H. Jemison, professor of practical agriculture. The next year the president became professor of agriculture and his faculty was reduced to four professors and an assistant

professor. Mr. Stubbs was called professor of natural science and secretary of the faculty. In 1878 W. H. Chambers became professor of agriculture and served until his death in 1881.

The program of instruction as stated in the catalogue for 1872 included a classical and scientific course of three years. In this course agriculture was to be taught in the second term of the second year and the first and second terms of the third year by lectures and excursions. The aim was "to educate scientific agriculturists." Additional higher courses of two years in agriculture, civil and mining engineering, and literature and science were offered. In the agricultural course the first year were analytical geometry, calculus, physics, astronomy, meteorology, geodesy, drawing, book-keeping, military tactics, agricultural chemistry and physiology, and agriculture (principles, relation to sciences, soils, manures and crops), with Latin, German or French as electives; the second year, higher equations, history and philosophy of mathematics, mechanics, mineralogy, geology, zoology, entomology, chemistry (qualitative and quantitative analysis), drawing, military tactics, staple crops, orchard fruits and vines, animal husbandry, diseases of animals, with a language as elective. The students completing the three year course were to be given a certificate. For the two year courses the degrees of Scientific Agriculturist, Civil Engineer, or Bachelor of Science and Literature were offered. If a student chose to complete all the courses he might get a Ph. D.

This program was evidently intended to meet the existing educational condition in the State, where college preparatory schools were very few. It was considerably changed the next year. For admission to college classes the student was to be examined in geography, English grammar, arithmetic, algebra to equations of the second degree, geometry (first book). For the literary course Latin and Greek (including grammar, lessons and 2 books of Caesar) were added. In the college in 1873 were a one-year preparatory course, three and two-year courses in agriculture

and four-year courses in literature, science, and civil engineering. The agricultural course leading to the degree of Bachelor of Agriculture included French, German, natural science (particularly botany and chemistry), mathematics, surveying, political and moral philosophy and lessons in practical agriculture throughout the course. With some modifications this program was continued until the end of President Tichenor's administration in 1882.

The number of students attracted to this college in its early years was small, though special inducements were offered. The minimum age for admission was 14 years. Sons of ministers or those preparing for the ministry were given free tuition and this was also offered to 2 students from each county provided they took the course in agriculture or engineering. In 1875 the catalogue gives the number of students as 88, of whom 4 were seniors, 9 juniors, 18 sophomores, 19 freshmen and 38 preparatory. In agriculture there were only 7 juniors and 1 sophomore. During the first decade the average number of students in college classes was 100; the total number of graduates was 101, of whom 16 had the B. S. A. degree.

In the East Alabama College 25 students graduated with the degree of bachelor of arts and one master of arts, between 1860 and 1870. In the Agricultural and Mechanical College from 1873 until 1882 inclusive there were 101 graduates with degrees as follows: B. A. 28, B. S. 13, B. S. A. 16, B. E. 33, C. E. 3, B. M. E. 1, M. A. 5, M. S. 2.

In 1882 William Leroy Broun, who had been a professor in Venderbilt and Georgia Universities, and had taken part in the organization of the Georgia Agricultural College, became president and except for one year held this position until his death in 1902. J. S. Newman of the Georgia Agricultural College was elected professor of agriculture in 1883 and President Broun thereafter served also as professor of physics and astronomy. Four-year courses in agriculture and chemistry, mechanics and engineering, literature and science were organized.

There were also two-year courses in agriculture and mechanic arts. The long course in agriculture was the same as that in literature during the first two years except that modern languages might be substituted for ancient languages. In the last two years the subjects were mechanics, physics, botany, astronomy, meteorology, geology, mineralogy, zoology, entomology, agricultural chemistry, vegetable physiology, cattle feeding and practical husbandry. Some lectures on agricultural subjects were given to the students in all the courses. There were also field observations, especially of the work on the college land.

The number of students in the college increased slowly up to 1887 and comparatively few gave special attention to agriculture. In 1884-85 out of 120 students there were only 1 senior and 12 juniors in agriculture. The total number of students in 1887 was 185. In the short and long courses in agriculture there were 96 students as compared with 90 in mechanic arts. From 1883 to 1887 inclusive there were 59 graduates, of whom 10 received the B. A. degree, 30 B. S., 4 B. S.A., 10 B. E., 3 C. E., and 2 M. S.

Experimental work in agriculture was begun by the college in 1875, and was carried on at Auburn and for a time at a branch station in North Alabama, where 10 acres were used for this purpose. A bulletin recording experiments with fertilizers on cotton at the North Alabama Station was published in the president's report for 1875. The college farm at Auburn was used principally to grow crops for observations by the students and farmers of the vicinity but a few experiments were carried on during the early years of the college and the results published in the president's reports.

In 1882 when Professor Stubbs was acting professor of agriculture, the first separate and systematic report on experiments at the college was published. This was a bulletin of 89 pages on the vineyard and analyses of grapes, strawberry culture, peaches, cow-peas, grasses, wheat, oats, fertilizers on potatoes, corn and cotton, analyses of fertilizers, cotton seed hull ashes, cotton seed,

In 1883 a state experiment station was established in connection with the college, with Professor Newman as director and Professor Stubbs as chemist. In 1885 a state department of agriculture was established and the office of the Commissioner was located at the college. One third of the net proceeds of the sale of fertilizer tags was paid to the college for the maintenance of its agricultural and mechanical departments, on condition that it would make fertilizer analyses and furnish the Commissioner a report on the work of the experiment station for publication by the State department. With state funds a farm was purchased near the college and was equipped with live stock and the necessary appliances for experimental work. A branch station was established at Uniontown in the canebrake region. Prior to the reorganization of the station under the Hatch Act in 1888 32 bulletins were published, recording the experimental work at Auburn and Uniontown. The work included experiments with varieties, fertilizers, methods of planting and cultivation on corn, cotton, oats, sweet potatoes, sugar cane, vegetables and strawberries, analyses of soils, fertilizers, etc.

Through its experimental work the college greatly increased its influence among the farmers of the State. The college also disseminated useful information among farmers by the participation of members of its faculty in meetings of agricultural societies and otherwise. In 1884, for example, a two days "camp meeting" was held on the fair grounds near Eufaula by the Barbour County Agricultural Association. Professors Newman, Stubbs and Mell (then professor of natural history) were among the speakers. The announcement of that meeting stated that "the farmers in attendance are expected to hold love feasts, class meetings and experience meetings, in which they will unreservedly swap ideas and compare experiences", etc. (Ala. State Dept. Agr. Bul. 4, 1884, p. 61.)

University of Mississippi and the Agricultural and Mechanical College of Mississippi.

The State of Mississippi first accepted the Morrill land-grant on October 30, 1866 but this was not recognized as valid by the Federal Government. The State constitution adopted in 1868 provided for a State Board of Education and a public school system and that "the legislature as soon as practicable shall provide for the establishment of an agricultural college or colleges", to which shall be given the Morrill land-grant fund. "On May 13, 1871, Congress passed a time extension amendment and the same day the reconstructed State legislature under Governor Alcorn again accepted the grant and conferred two-fifths of the fund on the University of Mississippi, and three-fifths on an institution for negroes established by the same act and (296) called Alcorn University. This action was satisfactory to Washington" and scrip for 209,920 acres was given to the State. This was sold for 90 cents per acre and the fund was so managed that in 1876 it amounted to \$227,150, which was invested in 5 per cent State bonds. In 1878 the legislature incorporated the Agricultural and Mechanical College, to which it transferred one half of this fund. Fifteen thousand dollars was used to purchase a college farm near Starkville and the new college annually receives the interest on \$98,575, which was increased to 6 per cent and amounts to \$5,194. The institution for negroes, reorganized in 1878 as "Alcorn Agricultural and Mechanical College of the State of Mississippi", was then given the other half of the land-grant fund.

The University of Mississippi had its origin in a State act of February 20, 1840, which gave it the proceeds of the sale of one township granted to the State for a seminary of learning under the act of Congress of February 20, 1819.

In 1841 Oxford was selected as the site of the university, which was incorporated in 1844 and opened for students November 6, 1848. It was at first governed by a self-perpetuating board of thirteen trustees but in 1870 the Governor, who had been an ex-officio member from 1857 began to appoint members of the board and in 1876 their number was increased to fifteen. The first faculty had a professor of natural sciences,

J. N. Millington, who was expected to teach chemistry, botany, geology, mineralogy, and natural philosophy. In 1853 instruction in analytical chemistry and agriculture in the second half of the senior year was scheduled. An act of March 5, 1850, provided for a State geological and agricultural survey to be connected with the University. This survey was first put in charge of Professor Millington. The first report, issued in 1857, was prepared by Lewis Harper who had been professor of geology, agriculture and analytical chemistry at the university from 1854 to (288) October 1856. ^ From October 1855 the assistant State geologist had been Eugene W. Hilgard, a native of Rhenish, Bavaria, who had received the degree of Ph. D. from Heidelberg University in 1853 and had served a short time as chemist in the Smithsonian Institution at Washington. An act of January 31, 1857, separated the survey from the university. Harper was then reappointed State geologist and served until March 1858 when he was succeeded by Hilgard who held that office until October, 1866 and again from 1870 to 1873. His first brief report was issued in 1858 and this was followed in 1860 by a "Report on the geology and agriculture of the State of Mississippi", of 391 pages, including a chapter on the principles of rational agriculture, treating of soils, principles of agricultural chemistry, manures, methods of culture, restoration of exhausted soils, maintenance of fertility, (290) etc. ^ Work on the survey was continued until October 1874, but provision for a final report was not made.

The Civil War caused the suspension of the university from 1862 to October, 1865. When it was reopened, Dr. Hilgard acted as professor of chemistry, mineralogy and geology and was made professor of chemistry a year later. When the university received the land-grant fund in 1871 a department of agriculture was established with a chair of agricultural and economic chemistry and the special geology and agriculture of Mississippi and this chair was filled by Professor Hilgard. A preliminary course of lectures on agriculture was delivered by him in 1871-72. A four-years' course was organized in October, 1872 including mathematics, English literature, political sciences,

ethics, physics, chemistry, mineralogy, geology (soils), meteorology, botany, zoology, and agricultural and economic chemistry. Daily lectures in general and special agriculture were scheduled throughout the four years, including field crops, horticulture, animal husbandry, rural engineering and architecture, landscape gardening, rural economy, and the agriculture and zoology of Mississippi. This course was explained by Professor Hilgard in an address before the Mississippi Agricultural and Mechanical Fair Association in 1872. (289) Professor Hilgard attended the meeting of the presidents and professors of agriculture held in Chicago in 1871 and on August 29 of that year made a report to the Chancellor of the University of Mississippi on the organization of the department of agriculture and mechanic arts in which he summarized what he had learned at that meeting. His general conclusions regarding the desirable character of a college course in agriculture are stated as follows:-

"While, therefore, access to the direct benefits of the institution should be as easy as consistent with its limited funds, we should stoutly insist that its main object is to impart, besides a general education, a thorough knowledge of the principles of agriculture, combined with such an acquaintance with its practice as will enable its graduates not only to know how things should be done, but to do them themselves in the field. But beyond the practice requisite to attain this end, the mechanical operations should not be made to encroach upon the time of the student; nor should the farm, upon which this practice is to be acquired, be considered otherwise than as a means of instruction, both by way of exercise and example, in the details. In the latter respect it should and must be a 'model', but not in the sense of pecuniary success; it being fully understood that the latter can only result from a judicious application of the general principles to local circumstances infinitely varied. * * * The labor required for the cultivation of the college farm should be provided for independently of the obligatory labor of students. Nevertheless, it is undoubtedly desirable that those who may wish to perform agricultural labor, beyond that required as a part of instruction, should be afforded opportunity of doing so." (291)

To organize properly a department of agriculture and mechanic arts he advises the following appointments:-

"1. A Professor of Practical Agriculture in all its branches, including dairy-farming, stock-raising, and fruit-culture.

2. A Professor of Technology and the Mechanic Arts.

3. A Superintendent of the Farm.

This minimum array of employees presupposes, of course, that --

1. The Chair of Civil Engineering be filled; also,

2. The Chair of Botany and Zoology; Horticulture to be included in the same.

3. That Agricultural Chemistry, as well as the special Agriculture and Economic Geology of the State, be otherwise provided for." (291)

Lack of means prevented the carrying out of this plan. An assistant professor of agriculture and farm superintendence was appointed and some field experiments were conducted for several years on about twenty acres. An attempt to get State funds for the department of agriculture failed. Insufficient funds combined with the fact that the course offered was too advanced and technical to fit in well with educational conditions in the State and the atmosphere of the university was not favorable to industrial education, prevented the success of this enterprise. Only 5 students in agriculture and mechanic arts are reported in 1873 and 3 in 1874, but it is doubtful if any students took the work in agriculture. Professor Hilgard withdrew from the university and after a short period on the faculty of the University of Michigan began in 1875 his long time service as professor of agricultural chemistry and head of the agricultural work of the University of California. In 1876 an attempt was made to revive the agricultural course at the University of Mississippi but without success. The farmers of the State, especially as represented by the granges, became very much dissatisfied with the course taken by the university in this matter and repeatedly urged the legislature to withdraw the land-grant funds from the university and establish an agricultural college.

The Agricultural and Mechanical College

The Agricultural and Mechanical College of the State of Mississippi was established as a separate institution by a State act of February 28, 1878 and was located near Starkville, whose citizens contributed to it \$9,000. It was opened for students in 1880.

The act under which it was established directed that it should be "a first-class institution, at which the youths of the State of Mississippi may acquire a common-school education and a scientific and practical knowledge of agriculture, horticulture, and the mechanic arts; also of the proper growth and care of stock, without, however, excluding other scientific and classical studies, including military tactics." Connected with it was to be an experimental farm of not less than 160 acres. In addition to the income from the land-grant fund the legislature made the following appropriations for its buildings, equipment and maintenance during the first five bienniums -- 1880 - \$85,000; 1882 - \$120,000; 1884 - \$65,000; 1886 - \$50,000; 1888 - \$35,320. (This reduction was part of a general policy of retrenchment in State expenditures and was due to depression of agriculture and dissatisfaction with heavy taxation.) The principal buildings erected during this period were a large main building, chemical laboratory, dormitory, mess hall, hospital, seven professors' houses, barn, and creamery. The college campus and farm included about 1,750 acres. The Board of Trustees included the Governor as president ex-officio and nine other members.

On April 1, 1880, General Stephen Dill Lee was elected president of the college and served in that capacity 19 years. He was born in Charleston, South Carolina, September 22, 1833, graduated at West Point in 1854, was in the United States army until 1861 and served with great distinction in the Confederate Army throughout the Civil War, attaining the rank of lieutenant-general. Afterwards he engaged in farming in Mississippi and was a State Senator for two years. His election to the presidency gave the college immediate favorable recognition in the State and his strong and wise management put it upon a firm foundation and made it an important institution of its

class from the beginning. Prior to the opening of the college a faculty was chosen, which included professors of English, and (in one chair) horticulture, biology, vegetable physiology and animal husbandry. From the Michigan Agricultural College R. F. Kedzie and F. A. Gully were to be professors of chemistry and agriculture respectively. A professor of military science and tactics was detailed from the War Department. There were also a principal and four assistants for the preparatory department, an instructor in writing, a farm foreman and a steward. During the first college year the total attendance was 354 of whom 267 were in the preparatory department, 73 in the freshman class, and 14 in the sophomore class. During the first ten years the attendance fluctuated between 257 and 415, about half the students being in preparatory classes. The total number of individuals during the period was 1,832. The college graduates from 1883 to 1890 numbered 104, about half of whom engaged in farming, teaching agriculture, or experiment station work. The student body was organized on a military basis and General Lee enforced strict military discipline. During the early years

The College work was confined to a single course of study extending over two years of preparatory, afterwards reduced to one year, and four years of collegiate and regular farm work was made compulsory as a part of the daily program. The College boys worked in the fields, grubbed stumps, cleared land, filled ditches (and they were numerous), and attended to the stock three hours a day, at eight cents an hour for their work. Conditions at that time were very crude and primitive. At night the students brought in their own coal to their rooms in the dormitory and made their fires; they drew their water from the deep wells on the campus with rope and bucket and carried it to their rooms for all bathing purposes; and their rooms were lighted with kerosene oil lamps. The mess hall, kitchen, and dining room, were in the basement of the old chapel building with only dirt and brick floors. (293)

The college course included for freshmen natural philosophy in first term, agriculture and horticulture in second term; for sophomores chemistry all the year, agriculture in third term; for juniors, anatomy and physiology in first term, horticulture, veterinary science and agricultural chemistry in second term, entomology and botany in third term; for seniors, chemical physics and zoology in first term, geology and agriculture in second term, meteorology and botany in third term. The period in the course in which the several subjects were taught

was shifted from time to time. In addition to these scientific and technical subjects, the course included algebra, geometry, analytical geometry, mechanics, trigonometry, surveying, civil engineering, astronomy, English language, composition and literature, history, United States Constitution, moral science and military sciences and tactics. Some elementary instruction in agriculture was given to preparatory students and after a time Professor Gully formulated this in a textbook entitled "First Lessons in Agriculture." Commenting on this instruction President Lee said that "work and contact with the experimental farm, college herds, creamery and gardens illustrate what is taught and give even these beginners a good idea of improved and progressive agriculture."

Field experiments were begun at the college in 1883 and were gradually increased in variety and extent, leading up to the organization of an experiment station in 1888. The early experiments included variety and fertilizer tests on corn and cotton, feeding experiments with steers and dairy cows, use of silage, variety^{tests} of apples, peaches, pears, plums, apricots, mulberries, Japanese persimmons, grapes, strawberries and vegetables. Dairying was promoted by means of a college creamery.

The college also joined in the farmers' institute movement and undertook the holding of several institutes annually in different parts of the State. In 1886-87 the trustees allotted \$500 of college funds to this work. The college was in close touch with the granges, farmers' alliance and other agricultural organizations.

A committee appointed by the Farmers' Association of South Carolina in 1888 visited the Mississippi College and published a favorable report on its work. With regard to the contact of the college with farmers this report states that "the numerous letters of the officers of the college, which we had the privilege of inspecting, on all kinds of farm topics, with the large number of visitors who came to the college, to get information on stock breeding, horticulture,

dairying and kindred subjects indicate that the people of the State look to the college for guidance in agricultural matters. * * * About 80 percent of the students are sons of farmers, two thirds of whom are of small means and many could not have attended but for the opportunities furnished of reducing their expenses by labor at the college, for which they are paid 8 cents maximum per hour." (478)

During its first decade the Mississippi College became firmly established and demonstrated that under conditions existing in the South an institution for white students which had the promotion of agricultural education as its primary interest could be successfully organized and managed. Its influence soon began to be felt in the agricultural affairs of the State and was extended to the other States similarly situated.

Agricultural College of Pennsylvania (State College) (See also p. 259)

The Pennsylvania legislature accepted the provisions of the Morrill land-grant act of 1862 on April 1, 1863. Judge Watts, Mr. McAllister, Dr. Pugh and others connected with the Farmers' High School had been active in promoting the passage of this act and its change of name to the Agricultural College of Pennsylvania in 1862 had undoubtedly been largely brought about to enforce its presumption that it would receive the benefits of the Federal grant. This is brought out in the account of the college prepared by a committee of the board of trustees in September, 1862, to which reference has already been made. (See p. In that document it is stated that the college "has been filled with students every session, except that of 1861, and many have applied from other States, who could not be admitted. With this success amidst the difficulties of the past, there can be no doubt of its ultimate success in the future, now that its college buildings are completed and the Agricultural College bill has passed Congress." (447)

Unfortunately the college had severe reverses soon after this because the status of the Civil War at that time and the events which culminated in the invasion of Pennsylvania and the battle of Gettysburg caused the enlistment of the entire student body in the Pennsylvania Volunteers. It was not able to resume regular operations until late in 1864. Meanwhile several colleges in the State, including the University of Pennsylvania, had become rival claimants for the whole or part of the land-grant fund. This caused the legislature to hesitate to give the Agricultural College absolute control of this fund. In section four of the Act of April 1, 1863, it is provided that "until otherwise ordered by the legislature", the interest on the land-grant fund is "to be paid to the Agricultural College of Pennsylvania." On March 3, 1864 Dr. Pugh at a hearing before the judiciary committee of the legislature reviewed the situation as follows:

"Several propositions in relation to this land scrip have been presented to the committee, which, so far as I understand them, embrace -

First - A proposition to divide the fund among three or four old institutions, letting each establish a professorship of agriculture and the mechanic arts and employ a teacher of military tactics.

Second - A proposition to divide it among a large number of literary institutions, involving the necessity of giving some to all that combine to apply for it.

Third - A proposition to establish a school of agriculture in one place, a school of mechanic arts in another, and a military school in a third."

His conclusion was that

"The land-scrip fund is not more than sufficient to endow one college, and hence should not be divided, and that it should be given to the Agricultural College of Pennsylvania until some other institution having a better claim upon it shall apply for it." (456)

This matter was not finally settled until the act of February 19, 1867 gave the college 1/10 of this fund for experiment farms and the income of the remainder annually, provided three experiment farms were maintained, one at the college and the others in the eastern and western parts of the State.

"In the act accepting the grant of 780,000 acres in scrip, the surveyor general of the State was instructed to obtain the scrip, to sell it, and to invest the proceeds. The governor, auditor general, and the surveyor general were appointed a committee to prescribe rules and regulations for its management.

The surveyor general realized \$439,186.80 from its sale. About 10 per cent, \$43,886.50, was used to purchase experimental farms for the college and the balance was invested in United States and Pennsylvania State bonds bought at a premium and giving \$381,500 face value of investment. The assembly on April 3, 1872, ordered these bonds sold and a 50-year State bond for \$500,000 at 6 per cent interest issued to the college to represent the land-grant endowment fund. Pennsylvania State College receives \$30,000 a year income from this source." (2)

By the Act of April 11, 1866 the legislature directed that payment of expenses of disposing of the land scrip be paid from the State treasury and authorized the trustees to borrow \$80,000 to complete the college building and "consolidate" the college debts. This mortgage was a serious incubus on the college until 1878 when the legislature made an appropriation for its payment. The college also incurred floating debts which caused it much embarrassment for many years. No further aid was given the college by the State until 1887.

Originally the entire charge to students for board, room rent, tuition, etc. was fixed at \$100 per year but in 1864 it became necessary to double this and two years later it was raised to \$260.

The college was housed in a substantial stone building, which as completed some years after the opening of the institution was 240 feet in length, 80 feet in average width and five stories in height, exclusive of attic and basement. In this building were the administrative offices, chapel, library, cabinets, laboratories, class-rooms and a large number of dormitories. Its internal arrangements were changed from time to time to meet the necessities of the developing institution. In 1885 two frame buildings were erected for work in mechanic arts. The other buildings on the college land were professors' houses, barns and smaller farm buildings. Not until 1887 did the State provide funds for other college buildings. About 1875 students began to rent rooms in the little village which was growing outside the college campus.

During the progress of the struggle to retain the land-grant fund for the agricultural college Dr. Pugh came to realize that in Pennsylvania a beneficiary of the land-grant act would be expected to maintain a broad "industrial college". Therefore in 1864 he made an elaborate report to the trustees regarding the financial and educational requirements of such an institution. (471) To this was added an argument against giving the land-grant fund to more than one institution in the State.

As regards financial support he shows by citing the endowments and revenues of a number of leading universities and colleges in the United States that relatively large funds are required to maintain a first-class college, though many persons had expressed surprise that the Pennsylvania Agricultural College should want all the land-grant fund "for the development and maintenance of this Industrial College."

Believing that the legislature and citizens of Pennsylvania had already shown by appropriating and subscribing money that they desired to have the agricultural college established "upon a large scale and with an efficient course of instruction" he asks for the consideration of the extent and character of the instruction which this institution should give:

- (1) "A complete system of industrial education must afford the means of making known to students all that can be known of the Principles and Laws, according to which the industrial operations of life are regulated."
- (2) This "must be a very extensive system."
- (3) It must be of a scientific character.
- (4) "A system of scientific education, embracing the entire range of the Natural and Physical Sciences, can only be carried out efficiently upon a large and liberal plan, supported by endowments equal to those of the best educational colleges in the country." (471)

The president of an industrial college should not only be a capable administrator but he should have a good knowledge of the leading branches taught in the college, particularly "the natural and physical sciences and their practical application to the industrial operations of life." He should be able to take charge of some advanced classes and "to consult with individual professors as to plans of scientific research."

The professors and assistants required for complete organization of an industrial college are as follows: (471)

- (1) "A Professor of pure Mathematics and the higher Mechanics and Astronomy. (2) A professor of Civil Engineering and Applied Mathematics. (3) A Professor of Natural Philosophy and Astronomy, Mechanics and Physics; and assistant, to prepare experiments for lectures, and to teach classes in the physical laboratory, where students would learn the art of experimentation with philosophical apparatus. (4) A Professor of Pure Chemistry; an assistant to help prepare lectures and look after classes in the laboratory; a sub-assistant to take charge of the chemicals, and to help in the laboratory, with no other salary than free tuition. A chemical department, embracing laboratory instruction, cannot be efficient with less aid than one professor and two assistants. (5) A Professor of Agricultural Chemistry and Geology; and assistant to help with field experimentation and work in the laboratory. (6) A Professor of Metallurgy, Mining and Mineralogy and Chemical Technology; an assistant, to prepare lectures and help in the laboratories. (7) A professor of Anatomy, Physiology and Veterinary. (8) A Professor of Natural History, more particularly of Zoology, Comparative Anatomy and Entomology. (9) A Professor of Botany, Horticulture and Entomology; one assistant, to take charge of the greenhouse, and give field instruction in Horticulture, and a gardener, to take charge of the garden. (10) A Professor of Practical Agriculture; as assistant, he should have a practical farmer of the highest attainments in his art, and the latter should be assisted by two good farm hands, and by all the students in the college. (11) A Professor of the English Language and Literature. (12) A suitable Professor to take charge of a Commercial Department. (13) A Professor of Modern Languages.

To these thirteen professorships or departments, he would advise the adding of (14) a Professor of the Latin and Greek Languages and Literature; (15) a Professor of Military Art, and Science and Teacher of Military Tactics; (16) a Treasurer, Book-keeper and Librarian.

Omitting the organization of the culinary department, the summary of the staff of such an institution would be as follows:

President and professors -----	16
Librarian and treasurer -----	1
Assistants -----	10
Superintendents-----	2
Total -----	29

There should be suitable buildings and laboratories as well as large collections of apparatus, natural history objects, etc. Means for scientific investigations should be provided and scholarships for needy and deserving students. Owing to lack of proper secondary schools this college must give preparatory courses. The college courses proposed are (1) Agricultural Science and Practice; (2) Engineering and architecture; (3) Industrial courses for instruction in such subjects as metallurgy, technological chemistry or pharmacy; (4) practical short course; (5) commercial course; and (6) a Literary department.

The financial requirements (evidently for the time being) of such an institution are set forth as follows: (471)

Expenditures

Sixteen professors at \$1,500 -----	\$24,000.00	
Ten assistants -----	4,000.00	
A farm superintendent -----	700.00	
Janitor and helps -----	<u>1,000.00</u>	\$29,700.00
For addition to museums, to scientific apparatus, and to library -----		5,000.00
For scientific investigation -----		5,000.00
For indigent students, orphans of soldiers, free scholarships, etc. -----		7,000.00
For repair of buildings -----		<u>1,000.00</u>
Total expenditures ---		\$47,700.00

Income

Four hundred students at \$50 per annum -----	20,000.00
Income required from endowment -----	<u>27,700.00</u>
	\$47,700.00

Very soon after this report was prepared Dr. Pugh died. The college retained the land-grant fund but had many difficulties in establishing itself firmly and getting adequate financial support.

A period of instability in the administration of the college ensued. Late in 1864 the presidency was filled by the election of William H. Allen, who had been long associated with Girard College in Philadelphia. Then Gen. John Fraser, who had been professor of mathematics at the Pennsylvania College, served as president for part of the year 1867. He was succeeded by Thomas H. Burrowes, formerly State Superintendent of Public Instruction, but he died in 1871.

There was a great lack of secondary schools in the State and the rural schools in many localities were so weak that children from the farms had great difficulty in getting sufficient education to enable them to enter the college though its requirements for admission were low. The location of the college, which in its early years was over 20 miles from a railway station, was long a hindrance to getting any considerable number of students. In fact their number declined and when President Burrowes was elected the college was nearly empty. A circular of the college issued in 1870 gives a list of 59 students, of whom 40 were in the first year but in 1871 when President Burrowes died the actual attendance was reduced to 37. After the reorganization of the college by his successor, the number of students rose to 148 in 1872, including 7 seniors, 10 juniors, 21 sophomores, 42 freshmen and 68 preparatory. There were 125 men and 23 women. These numbers had only minor variations for the next decade.

Up to 1867 only one course of study had been in effect and each student had been required to perform three hours of manual labor per day on the farm or about the college building. After the acceptance of the land-grant fund military drill was required and at first took the place of one day's manual labor per week. There was much dissatisfaction regarding the labor requirement and in September, 1866, the trustees ordered "that the rule requiring every student to work three hours daily on the farm, having proved uniformly injurious to the financial and educational interests of the college, shall cease to be enforced

at the end of the present term." (456) Voluntary labor of students with pay was provided. For students in the college departments daily military drill was required and preparatory students were to have one hour's exercise daily in a gymnasium.

"Agriculture will be taught as an experimental science, and will be placed under the care of a professor of agriculture, who will give instruction by means of books and lectures in the class room, numerous experiments on the farm, and agricultural excursions. Every student in this department will be required to assist in the work connected with the experiments and to record them in a memorandum book, which will be examined from time to time by his instructor." (456)

The college year which had been practically one session beginning about the middle of February and ending early in December was divided into two terms of twenty weeks each. Three 4-year courses, general science, agriculture and literature, were established. A graded system of military instruction for all students was adopted.

"Liberal provision was made for superintendence and instruction in the preparatory department, together with practice work in the various subjects of study. Such practical work and original investigation, here first called 'practicums', had never before been systematically established except in chemistry. A course in mechanical and civil engineering and one in mining and metallurgy were projected and partially arranged for."

It is evident that these changes did not fit in well with financial and other conditions then existing in the college.

"The larger number of instructors and the various obligations incurred in the acceptance of the land-scrip fund proved a serious drain upon the resources at hand. The number of students rapidly diminished, partly because of the increased expense, partly because of the higher standard of admission, and a lack of confidence in the stability of the college. No class had been graduated in 1867, and when, in June, 1868, the last of the old students passed out there were but few to take their places."

President Burrowes undertook to remedy the situation by a policy of economy and retrenchment.

"There was practically but one course of study maintained, and the old arrangement of sessions and vacations and the manual labor system were restored as being more in harmony with the surroundings." (456)

The first two years included work in arithmetic, algebra and geometry, chemistry, botany, physiology, geography, history, English, Latin and Greek, with practice in agriculture and horticulture. The third year as arranged for an agricultural class included trigonometry, analytical geometry, surveying, civil engineering, botany, chemistry, civil government, history, English literature and ancient languages, with lectures and practice in agriculture. At the end of three years the student might graduate with the degree of B.S.A. or go on in a scientific or literary course for another year to obtain the degree of B.S. or a fifth year for B.A. An elective system was practiced to a certain extent, particularly with reference to the ancient and modern languages. For admission to college courses the student must be 15 years of age and have a common school education. President Burrowes gave the instruction in practical agriculture.

Rev. Dr. James Calder became president early in June 1871 and served in that capacity until 1880. During his administration changes were made which broadened the work of the college and brought it more into line with other educational institutions in the State. This was emphasized by the change of name in 1874 to Pennsylvania State College. Two women were admitted in 1871 and their number increased to 23 the following year and to 47 in 1881.

Three college courses of study were again organized - Scientific, classical and agricultural. Preparatory and music courses were continued. Instruction in military tactics was added to the curriculum in 1875 and two years later an Army officer was detailed by the War Department to take charge of the military department. Manual labor was required but for seniors and juniors this consisted of laboratory work. No class was graduated in 1872 and from that time the college year began in August and ended in July. In 1876 the long vacation was transferred from winter to summer.

In 1870 John Hamilton, a farmer living near the college, who had been a soldier in the Civil War, was made military instructor and the next year when he graduated at the college, he became also professor of agriculture. The course in agriculture as revised at that time began with general agriculture in freshman year. The sophomores had plant culture, soils and horticulture; the juniors had fertilizers, animal husbandry, farm machinery, rural laws and agricultural chemistry; the seniors had veterinary science, rural architecture, rural economy, landscape gardening, and essays and discussions on agricultural subjects. Botany, zoology, general and agricultural chemistry were included in this course. Ancient languages and French were elective. All the students in the college were expected to take the work in general agriculture in freshman year. Professor Hamilton soon relinquished his military work but was largely employed as business manager and treasurer of the college and general superintendent of the three experimental farms. Few students were attracted to the upper classes in agriculture, where the instruction had little scientific basis. The inadequacy of such instruction was recognized by Professor Hamilton in his final report as professor of agriculture in 1880 and he advised that his successor should be a man trained in agricultural chemistry. At this time the State grange also expressed dissatisfaction with the agricultural work of the college.

From its beginning to 1880 the number of graduates was 122, of whom 43 had taken the degree of Bachelor of Agriculture but after leaving college only 14 had become farmers. Among them was also a professor of agriculture, a professor of horticulture and an officer of the United States Department of Agriculture.

About July 1, 1880, Joseph Shortlidge became president of the college but continued in that position only a short time. He was succeeded by Professor James Y. McKee as acting president. The faculty now undertook a revision of the educational program of the college. Meanwhile Whitman H. Jordan, who had studied agricultural chemistry under Professor S. W. Johnson in the Yale Sheffield

Scientific School and had taught at the Maine Agricultural College, had become professor of agriculture and agricultural chemistry. His influence is seen in the reorganized curriculum. The work in the preparatory department was to be made more like that of a high school. The first two years of the college course were to be largely devoted to instruction in mathematics, fundamental sciences, and other basal subjects. Technical instruction was to be given in the junior and senior years. A new chair in civil engineering was created. Systematic instruction in Mechanic Arts was begun. New special courses in natural history, chemistry and physics, and civil engineering were scheduled.

The course in agriculture included for juniors mechanics, civil government, mineralogy, agricultural chemistry, cryptogamic botany, zoology, entomology, fertilizers, crops, and agricultural engineering; for seniors mental philosophy, political economy, ethics, history of English literature, geology, horticulture, anatomy and breeding, feeding, dairy and sheep husbandry, veterinary medicine, and farm economy. Laboratory and field practicums throughout the course.

In 1881 the board of trustees asked the legislature to appoint a committee to investigate the college. A joint committee of the two houses was appointed and made a report which on the whole was favorable. On the practical features of the instruction given at the college the committee comments as follows:

"In connection with the usual studies of the class-room, we find that there is carried on a very extensive and progressive system of practical training in the applications of knowledge, which, for extent and thoroughness, is equaled by few, if any institutions, of which we have information. The student in agriculture, for example, goes into the laboratory until he becomes a well-trained analyst, and into the field and barn to observe processes or to conduct investigations. The student in horticulture works in the gardens and vineyards. The student in mechanic arts goes into the shop, and is trained in the use of tools, as well as the principles of mechanics. The student in civil engineering acquires a knowledge of the instruments and the methods of his profession by actual work in the field; and similarly, in every department that admits of it, subjects are taught with constant reference to their practical application in the various industries of life. When the institution was first opened to students, a considerable amount of manual labor was required of all. This system was abandoned after a trial of several years, and the practical work now required is regarded as educational, rather than a matter of manual labor, though it evidently serves the two important ends of giving physical exercise and skill in manipulation." (459)

George W. Atherton became president of the college in 1882. He was a native of Massachusetts and a graduate of Yale College after service in the Army in the Civil War. He had taught at St. John's College, Annapolis, Md. and at the Illinois Industrial University and had been professor of political economy in Rutgers College in New Jersey for 14 years. He had a broad understanding of the economic and industrial situation in the United States and believed that the land-grant colleges had great opportunities in training men in science and the arts, who would be useful in the future development of the country. In Pennsylvania existing conditions favored the immediate development of instruction in the State college along the lines of the natural sciences and mechanic arts. In agriculture economic conditions and the lack of scientific knowledge relating to this art made the outlook for securing any considerable number of students in agricultural courses of college grade quite unfavorable. The experiment station movement had, however, proceeded far enough to show that research on agricultural subjects was likely to produce important scientific and practical results. An increasing body of intelligent farmers was becoming interested in such investigations and was calling on the college for information concerning their results. President Atherton therefore laid emphasis on strengthening instruction at the college in science and mechanic arts and improving the equipment for such work. He also encouraged the enlargement of the work of the college in agricultural research and the prompt publication and dissemination of its results. He joined with the representatives of the other land-grant colleges in seeking further federal aid and actively promoted the movement which resulted in the Hatch Experiment Station Act. He urged upon the State its responsibility for the maintenance and development of the college and aroused sufficient public sentiment in its favor to bring about substantial appropriations by the legislature for buildings and other equipment.

The educational program of the college was conservatively modified from time

to time in an effort to meet existing conditions. In the annual report of the college for 1882 the president states that the program of the preparatory department has been too elaborate with the result that comparatively few students have been encouraged to enter the regular college classes. He therefore advises that the program of this department be narrowed so, as to be strictly preparatory. The catalogue for 1883-84 gives the following four-year courses; General science, Latin-scientific; Classical, a general course in agriculture and special courses in agriculture, chemistry and physics, civil engineering and natural history. There were also two-year courses in agriculture and in mechanic arts. Students were admitted to the college courses at the age of 15 years and the entrance requirements for the agricultural courses included only arithmetic, English grammar, geography and spelling.

In the general course in agriculture the first two years were devoted to mathematics, surveying, the general principles of the natural sciences, modern languages and rhetoric, with Latin as an elective. The applications of the sciences to agriculture and the technical agricultural subjects were included in the program for the last two years.

The courses in agriculture offered at this time were evidently too scientific and technical to meet the economic and educational conditions existing in the State. In 1882 there were 20 students in agriculture, in 1884 three, and in 1887-88 five.

Meanwhile the work of the college in the natural sciences and mechanic arts was being strengthened. In 1884 teaching of Greek was dropped and the course in Mechanic Arts was reorganized. Two years later a course in mechanical engineering was established. The efforts of President Atherton to secure more substantial equipment for the college came to fruition in a State act of June 3, 1887, in which there were appropriations of \$100,000 for buildings and equipment

including \$35,000 for a chemistry and physics building, \$20,000 for a drill hall and assembly room, and \$5,000 for a greenhouse and botanical laboratory.

The number of students as recorded in the catalogue in 1883-84 was 128 (graduates 5, post-graduates 2, seniors 5, juniors 9, sophomores 9, freshmen 27, in special courses in agriculture 1 and in chemistry 1, preparatory classes 69); in 1886-87 140 (preparatory 63), and in 1887-88, 176 (preparatory 77).

Before the Farmers' High School of Pennsylvania was opened to students it was planned to have the institution carry on analytical and experimental work relating to agriculture. In the State act of May 20, 1857, provision was made for the analysis at the college, "without charge, of all soils and manures which shall be sent by citizens of this Commonwealth for that purpose and a correct report of the result of said analysis, accompanied by such information as may be useful in the case" and the college was directed to "furnish reports of the results of all experiments with trees, shrubs, plants, seeds, soils and breeding and rearing of stock, to at least one newspaper in each county in the Commonwealth for publication." Between 1857 and 1867 the experimental work was to a large extent horticultural but included some observations on the cultivation, fertilization and growth of varieties of agricultural plants and on various kinds of farm implements. Some meteorological observations were also made. Most of the experiments were simple but some involved research in the chemical laboratory.

An act of February 19, 1867 directed that one tenth of the federal land-grant fund should be used to purchase experimental farms and the income of the remainder of this fund was given to the college on condition that it maintain 3 such farms, one near the college, and the others east and west, respectively. Under this act one hundred acres of the college farm were set aside for experiments and similar tracts were obtained in Chester and Indiana counties. For about 15 years field experiments were carried on under this plan. These included

experiments in variety testing, rotation, planting, cultivation, fertilizing and harvesting of corn, barley, oats, potatoes, clover, timothy, etc. At the college the experiments were under the immediate direction of the professor of agriculture and were systematically conducted. The outlying farms were largely controlled by local committees and had frequent changes of personnel and plans of work with unsatisfactory results. In 1887 the legislature authorized the sale of these farms.

After the appointment of Professor Jordan in 1881 a new program of field experiments at the college was introduced, a more careful checking of the field experiments was made, and laboratory research became an important element in the work. A number of experiments in the production of feeding stuffs and the feeding of domestic animals were also made. In 1884 the professor of agriculture was appointed chemist of the State board of agriculture, and in that capacity made the analyses necessary in the fertilizer control maintained by that board. In 1885 Professor Jordan was succeeded by Professor William Frear, who remained in charge of the work until 1887, when he became chemist of the experiment station then organized under the Hatch Act. In 1882 the publication of bulletins was undertaken and 15 were issued prior to the organization of the station.

President Burrowes in 1870 instituted a meeting at the college which
(461)
resembled what is now called farmers' week. It was then known as the "annual
harvest reception", which occupied the last four or five days of the Spring
term. Professor Buckhout has described it as follows:

"During the forenoons the classes were examined, and while the professors and students were thus engaged the college and farm were open to the inspection of guests. In the afternoons military drill was given and newly invented implements and machinery tried.

In the evenings lectures were delivered by the faculty and others, and literary and social entertainment given by the students' societies.

A generous circular of invitation proffering free entertainment was sent out, but in the second year of its trial that which was long afterwards known as the 'big day' brought so large and heterogenous a body of visitors, many of whom had little knowledge of or interest in the institution, that the plan was modified and became a trial of farming implements, particularly reapers. Gradually this was done away with, as other times and places proved more satisfactory to the manufacturers."

Members of the faculty attended and addressed meetings of the State and county agricultural societies and the granges and after the organization of the farmers' institutes under the State board of agriculture also took part in these assemblies of farmers. In 1882 a two weeks' course of about 30 lectures was given at the college under the title of a farmers' institute and this was continued for several years. Beginning with 1885 the State made an appropriation of \$1,000 for the institutes in different parts of the State held under the direction of the State board of agriculture, and this was increased to \$3,000 in 1887.

The history of the development of the Pennsylvania State College during the first quarter of a century after the passage of the Morrill land-grant Act reveals the slow development of an institution in a new field and the difficulties attending such a process under conditions existing at that time. Started as an institution to train farmers it soon became evident that it was not practicable to give satisfactory courses of instruction in agriculture at that time and that the children of the farmers of the State were in no condition or mood to receive such instruction in this subject as was made available to them. The most evident educational need in the region where the college was located was for general education of secondary grade and this is what the great majority of the students who attended this college in its early years received. On this foundation it seemed most appropriate to the authorities of the institution to build up college courses which should be differentiated from those of other colleges of that day chiefly by the larger place given to the fundamental natural sciences and their applications to practical affairs. The way was thus opened for the development of instruction in those sciences with an increasing amount of laboratory work. Then came the incentive to undertake broader instruction in the mechanic arts because of the large industrial development going on in the State. The college then entered on a period of development in which emphasis was laid on its work relating to engineering and other mechanic arts.

Meanwhile the lack of agricultural students permitted the organization of systematic and in some respects fundamental research relating to agriculture. That the program of the college which involved emphasis on the teaching of the sciences and mechanic arts was justified by the conditions existing in the State during the last two decades of the 19th century is shown by the number of students in 4-year college courses at the beginning, middle and end of that period. In 1882 there were 35, of whom 9 were freshmen; in 1892 the total was 179, with 65 freshmen and in 1902 it was 515 with 214 freshmen. Meanwhile, through the work of the experiment stations there and elsewhere the foundation was being laid for the large development of agricultural instruction which was to come later.

Cornell University in New York

New York accepted the provisions of the Morrill land-grant act May 5, 1863, and received scrip for 989,920 acres. Meanwhile numerous educational institutions within the State had sought to have the legislature give them at least a portion of this fund. The People's College at Havana (now Montour Falls) and the State Agricultural College at Ovid, both of which had been active in promoting the passage of the land-grant act, pressed their claims most actively. By an act of May 14, 1863, the legislature decided to give all of this fund to the People's College. (See p.231) This was done, however, on condition that within three years the college "should meet all the requirements of the Morrill Act, should have at least ten professors, a farm of 200 acres supplied with stock and agricultural machinery, shops and machines, a building for at least 250 students, a suitable library and all needed scientific apparatus, all of which was to be fully paid for by the college trustees; and that commencing in 1868 the college was to receive students from the different counties of the State free of tuition." The number of free students was to be determined from time to time by the Regents of the University of the State of New York and were to be chosen for scholarly excellence.

But the same year Mr. Charles Cook, who had given the college large financial support and as a State senator had been largely influential in securing for it the land-grant, was stricken with apoplexy and though he partially recovered refused to give it further aid. Nevertheless the trustees went ahead in the hope that funds to equip the college could in some way be found. A faculty was chosen and the college was opened in 1864.

A committee of the regents of the University of the State of New York, who visited the college in February 1865 reported that the building would accommodate only 150 students. At that time John Phin testified that he was professor of chemistry and physics as applied to agriculture and mechanic arts and began instruction April 15, 1864. There were 73 boys and 75 girls in attendance of the average age of 15 years but all of them were in preparatory classes. The preparatory course covered 3 years and the subsequent college course was to include theory and practice of agriculture and horticulture, agricultural chemistry, engineering, surveying, natural sciences, mathematics, ancient and modern languages, logic, mental science, etc. In a speech in the State Senate in March 1865, Andrew D. White said that People's College had only three professors and only 100 acres of land. There were no shops, machinery, apparatus or collections. The property was heavily mortgaged. The college therefore could not meet the conditions under which it was to receive the land-grant and its faculty was disbanded in 1865.

Meanwhile the friends of the State Agricultural College at Ovid, (see p.223) which had been closed since 1862 and was financially bankrupt, appealed to Ezra Cornell, who was a trustee of this college and a member of the New York Senate, to aid in securing the land-grant fund, or at least a part of it, for this college.

Ezra Cornell (1807-1874) was born in Westchester County, New York, and was the eldest of 11 children. His parents were Quakers, who had come from Massachusetts. His father was a potter and school teacher. In 1869 the family moved to DeRuyter in Madison County, where Ezra worked at farming and lumbering and went to school winters. Then he learned carpentry and built a two-story house for his father. When 19 years old he went to Syracuse and worked at his trade and two years later moved to Ithaca where he built mills and dams, blasted tunnels and worked in mechanic shops. When the telegraph came and experiments in laying the wires under ground proved unsatisfactory Cornell put them on poles. Then he made a considerable fortune by the establishment of telegraph lines. In 1840 he became interested in farming, imported improved breeds of live stock and improved the plow. He became vice-president and in 1862 president of the New York State Agricultural Society ~~in 1862~~ and went to the Royal Agricultural Exhibit at London and visited with much interest the experimental station at Rothamsted. That year he became a member of the lower house of the New York legislature and afterwards of the Senate.

His attitude in response to the appeal from Ovid College he has stated as follows:

"I advised them to unite with the friends of the People's College, and make up a fund sufficient to purchase all the scrip of the State and locate it for the benefit of both colleges, entering into an agreement for an equal division of the profits to arise from the transaction, between the two colleges at Havana and Ovid. I urged the same policy upon Hon. Charles Cook, who represented the People's College, offering to be one of ten gentlemen (if no more could be found to unite in the enterprise) to put up the funds to purchase the land scrip of the State. I found no one willing to entertain this project in behalf of either college though the entire balance of 914,000 acres could have been purchased readily at the time for \$500,000." (337)

At a meeting of the trustees of the college at Ovid on September 20, 1864 Mr. Cornell favored moving the college to Ithaca and offered to give it a farm of 300 acres there, with its buildings and enough money to make up \$300,000, provided the legislature would give at least \$30,000 annually from the land-grant fund.

As a member of the State Senate Mr. Cornell favored a division of the land-grant fund between two institutions but was opposed in this by Andrew D. White, who had come from Onondaga County as a Senator in January, 1864. Cornell was chairman of the Committee on Agriculture, and White of the Committee on Literature. The problem of the disposition of the land-grant fund was finally referred to these two committees for their joint action. White overcame Cornell's objection to making the grant to a single institution and on February 7, 1865 introduced a bill establishing Cornell University at Ithaca and giving it the entire land-grant fund. He supported his bill in an elaborate speech in which he described the unfortunate condition of the colleges at Havana and Ovid and said that while he had favored the People's College he was now convinced that the plan proposed in his bill offered the only practicable solution of the problem. This bill was opposed by Horace Greeley and other friends of the two colleges but became a law April 27, 1865. The matter having been thus settled Horace Greeley and Erastus Brooks, trustees of the People's College and William Kelly and J. B. Williams, trustees of the State Agricultural College, became members of the first board of trustees of Cornell University.

There thus came into the organization of Cornell University a combination of the influences represented in the long effort of the State Agricultural Society to establish an agricultural college, in the more recent attempt of the mechanics' organization to organize an industrial college which had been modified particularly by the activities of Horace Greeley and Amos Brown so as to make a plan for a much broader institution, and in the personal attitude of Andrew D. White, which was the result of his connection with Yale College and the University of Michigan and his acquaintance with the European universities.

Mr. Cornell was also familiar with the Illinois plan for industrial universities and had corresponded with Turner about it.

The act establishing the university had been drafted by Cornell, White and Charles J. Folger, chairman of the judiciary committee of the State Senate. It created a body corporate to be known as Cornell University, the leading object of which was to teach such branches of learning as are related to agriculture and the mechanic arts, including military tactics but also such other branches of science and knowledge as the trustees may deem useful and proper. Ten trustees were named in the act and were authorized to elect seven others. There were also to be seven ex-officio trustees, the governor, lieutenant-governor, speaker of the Assembly, superintendent of public instruction, president of the State Agricultural Society, librarian of the Cornell(Ithaca Public) Library, and the eldest lineal male descendant of Ezra Cornell. In 1867 the number of elective trustees was reduced to 15 by making Ezra Cornell a life member and the president of the university an ex-officio member. The term of the elective trustees was fixed at five years, three members to be chosen each year and one of the three to be annually elected by the alumni after their number reached 100. In 1895 the number of elective trustees was raised to thirty, twenty to be elected by the board and ten by the alumni - in classes of four and two respectively. The State Commissioner of Agriculture was added to the ex-officio members.

The university was required to receive annually one student from each of the 128 assembly districts in the State free from any tuition fee or incidental charge. This number was afterwards increased to four students from each of 150 districts. "Persons of every religious denomination, or of no religious denomination, shall be equally eligible to all offices and appointments." The farm and grounds must consist of not less than 200 acres and two years were granted for the provision of suitable buildings and equipment. The limit of real and personal property to be held by the university was fixed at \$3,000,000. This limit was removed after the university had lost over \$1,500,000 bequeathed to it by Mrs. Jennie McGraw Fiske. The income of the land-grant fund was given to the

the university on condition that Mr. Cornell give it \$500,000 and also \$25,000 to the Genesee Seminary at Lima, New York. This last provision was a concession permitted by Mr. Cornell on account of the persistent effort of the seminary to secure a portion of the land-grant fund.

Cornell University was to be a university under the patronage of the State, though not controlled by it, but a much broader type of university than had thus far been created in this country because it would have not only literary and scientific courses but also those directly relating to agriculture and mechanic arts.

Mr. Cornell's announcement, which was inscribed on the seal of the university, contained a far broader conception of a university than had hitherto been thought of in educational circles. To found "An institution where any person can find instruction in any study" seemed at that time to educators and college men generally not only to be impracticable but to be contrary to any reasonable educational policy. It was thought that its organization would be so loose and its instruction so diffuse as to break down all proper standards for higher education. Guided by the practical wisdom of Mr. Cornell and by the sound judgment and broad educational training and experience of Dr. White the institution was established on a sound basis financially and educationally.

At the inaugural ceremonies of Cornell University George William Curtis said that 10 years before, White in a conversation with him at Ann Arbor, Michigan, expressed a desire that "in the greatest State there should be the greatest of universities; in central New York should arise a university which should satisfy the wants of the hour * * *. It should take hold of the chief interest of the country, which is agriculture; then it should rise step by step, grade by grade until it fulfilled the highest ideal of what a university could be." Earlier than this after White returned from studies in European universities he attempted to interest ^{wealthy} men in establishing a broad university in this country but failed to get financial support for such an enterprise.

The State controller, who was charged with the sale of the land-grant scrip, had sold 76,000 acres for \$64,000 when Mr. Cornell undertook to acquire the remainder for the benefit of the university. In 1865 he bought 100,000 acres for \$50,000 and the next year made a contract with the State to purchase the rest of the scrip for 30 cents per acre, and to pay an additional 30 cents per acre to the State whenever scrip or land was sold, the sum thus obtained to be the land-grant fund, and with the balance of the profits to constitute an endowment fund for the university which would not be subject to the restrictions of the Morrill land-grant act. He first sold 6,080 acres and located 525,920 acres, mostly in timber land in Wisconsin, and had to pay for its location, taxation and protection against timber thieves. In 1868 and 1869 he was persuaded by the trustees to sell 381,920 acres still in the hands of the controller, which netted \$128,499.20 for the Cornell endowment fund and increased the land-grant fund by \$229,152.

The propriety of Mr. Cornell's transactions was disputed and it was not until October 1874 that they were finally approved by the land commissioners.

The rest of the land was kept off the market at tremendous expense and when Mr. Cornell proposed to transfer the land to the university, with the cost of its purchase, location and care, amounting to over \$576,000, from \$50,000 to \$90,000 was required to meet the annual charges against this land. For seven years the university bore the burden of this unproductive investment and had to borrow from its endowment fund to carry it. To Henry W. Sage, chairman of the board of trustees, is due in great measure the final success of this enterprise. He persuaded the board to hold the land until after 1880 and fortunately the price of pine timber rose so rapidly that when the university sold 140,000 acres in 1881 and 1882 they brought over \$2,300,000. When the land was all sold the total endowment secured to the university through Mr. Cornell's plan was about \$5,460,000. In addition he gave the 200 acres on which the university was located

and other gifts, amounting to over \$650,000. The land-grant fund finally amounted to \$688,576.12.

The private gifts by him and other individuals amounted to \$1,433,457 five years after the opening of the university and at the end of thirty years to about \$9,500,000. The State made no direct appropriations to the university until 1893. In 1873 the income of the university was \$101,000 including \$18,000 from tuition fees and in 1881 it was only \$100,000. Friends of the university kept it from going into bankruptcy until the great land sales of 1881-82 made its financial status stable.

For buildings the university had at first one which was originally intended for a water cure (now Cascadilla Hall) and a new stone building, afterwards known as Morrill Hall. A large temporary wooden building was erected in 1869. Six other substantial buildings for the use of students were erected during President White's administration.

Through purchases in Europe by President White and in other ways an unusually large equipment in apparatus, collections, and other facilities for instruction in science and the arts was obtained during the early years of the university. Its library in 1868 contained about 12,000 volumes and grew rapidly in variety and extent.

The plan for the organization of the university presented to the trustees by Dr. White October 21, 1866, had the following main features. The university should have two great divisions; I - Special sciences and arts (including -1- agriculture, -2- mechanic arts, -3- civil engineering, -4- commerce and trade, -5- mining, -6- medicine and surgery, -7- law, -8- jurisprudence and political science, and -9- history); II Science, Literature and the arts in general. 26 professors were needed but for the present 16 resident and 10 non-resident professors would suffice. In the department of agriculture there should be professors of (1) the theory and practice of agriculture; (2) agricultural

chemistry; (3) general and analytical chemistry; (4) geology and mineralogy; (5) zoology and comparative anatomy; (6) botany; (7) civil engineering; (8) veterinary surgery and breeding of animals; and (9) physiology, hygiene and physical culture. There should also be an experimental farm. Courses of 4, 3 and 2 years would be offered.

The salaries of professors should range from \$1,750 to \$2,250. Manual labor by students should be elective. There should be a gymnasium, with an instructor; baseball and boating should be encouraged. Military education should be encouraged or made compulsory. The university should have a vital connection with the school system of the State. Dormitories should be erected for only a limited number of students.

When the university was opened in October, 1868, Dr. White laid great stress on "equality between different courses of study. It is determined to give special courses like those in agriculture, mechanic arts, engineering, and the like, equality in honor with other special courses. * * * It gives the farmer's son the same standing that it gives the son of any other citizen, * * * it makes his study the equal of any study * * * another part of our plan is to combine labor and study", ⁽⁴¹⁹⁾ on a voluntary basis. Much will be made of scientific study and the effort will be to educate the man intellectually, morally and religiously.

Efforts would be made to improve methods of teaching, (1) by a better use of the lecture system and (2) by a union of the study of things with study about things. There would be freedom of choice between various courses of study and equality in position and privilege between the different courses. For a time every student in the university would be required to attend a course of lectures on general agriculture.

The main divisions of the university were at first called colleges and in 1868-69 there were colleges of agriculture, mechanic arts, chemistry and physics, history and political science, languages, literature and philosophy, mathematics and engineering, military science and natural science. Colleges of civil engineering and architecture were added in 1871. But after 1873 these divisions were denominated departments and it was not until 1896 that the departments were grouped in colleges.

The division of courses into "general" and "special" was kept up during President White's administration. At its close in 1885 there were five general courses; arts, literature, philosophy, science, and science and letters; and 11 special courses; agriculture, architecture, analytical chemistry, chemistry and physics, civil engineering, electrical engineering, mechanic arts, mathematics, natural history, medical preparatory, and history and political science. At first students who chose to take the "optional course" were allowed to select freely the subjects they were to study but before long it was apparent that this plan was not working well. Then a more limited scheme of electives within the regular courses was adopted and in most courses the electives were confined to junior and senior years. More latitude was permitted in the general than in the special courses.

To give the university at the outset good standing educationally it was Dr. White's plan to obtain a number of experienced and highly successful teachers as non-resident professors to give limited courses of lectures during the college year and to employ as resident professors comparatively young men of good training and promise. In the selection of such men he consulted especially Louis Agassiz. Among the first non-resident professors were Agassiz in natural history and Goldwin Smith in English history and among the resident professors were George Chapman Caldwell in agricultural chemistry, Burt Green Wilder in comparative

anatomy and zoology, Albert Nelson Prentiss in botany, horticulture and arboriculture, James Law in veterinary medicine and surgery, and John L. Morris in mechanic arts. Dr. White was professor of modern European history.

The year the university opened there were 15 professors, 3 assistant professors and 6 non-resident professors. The limited income of the university prevented rapid growth of the faculty until after 1880. In 1885 there were 56 teachers and in 1889 there were 99.

At first men only were admitted as students in the university.

Mr. Cornell had, however, expressed himself in favor of coeducation in a letter to his granddaughter February 17, 1867. "I want", he wrote, "to have girls educated in the university, as well as boys" and in his address at its opening he said "I believe we have made a beginning of an institution which will prove highly beneficial to the poor young men and poor young women of our country." (419)

Dr. White was more conservative but was willing to have the experiment tried when there were suitable accommodations for the women. On the day of the opening Henry W. Sage told President White that when the time came for the admission of women he would provide an endowment and soon after he became a trustee he offered to erect and endow a residence hall for women. Then President White in 1871 declared in favor of their admission and a committee of the trustees was appointed to consider this matter, who reported favorably February 13, 1872. Mr. Sage's gift was accepted, the building was erected and women were formally admitted in the fall of 1874. Meanwhile in 1871 a student from Vassar College had been admitted to lectures with the consent of certain professors.

No preparatory classes were organized in the university. For admission to the freshman class the requirements applying to all courses were at first English, geography, arithmetic and algebra to quadratics, with Latin and Greek for the Arts course and Latin for the course in philosophy and literature.

After 1876 a modern language or advanced mathematics was required for the courses in letters and in science. For the courses in agriculture, architecture and engineering only the primary requirements were in force until 1887.

The first year 414 students were matriculated in the university but this number was not reached again until the twentieth year, when there were 457. The smallest number, 125, was in 1880-81. The matriculation, attendance and degrees at several times within the first twenty years are shown in the following table:

<u>Year</u>	<u>Matriculation</u>	<u>Attendance</u>	<u>First degrees</u>	<u>Advanced degrees</u>
1868-69	414	414	16	
1872-73	138	539	95	3
1877-78	180	529	67	3
1882-83	153	406	65	6
1887-88	457	1,022	137	12

During the administration of President White the university developed most strongly in the courses in natural science, where the attendance of students was greatest. Between 1868 and 1886 482 students received the degree of bachelor of science. On its mechanical side the largest development during this period was in civil engineering, in which 171 students received their first degree, as compared with 65 in mechanical engineering.

In 1885 Charles Kendall Adams came from the professorship of history in the University of Michigan to the presidency of Cornell University. He was especially interested in the humanities and during his administration of seven years, while the work of the university in its scientific and technical departments prospered there was an especially marked increase in the interest in humanistic studies. In his report for 1888-89 President Adams said that "within four years, the number of classical students in the university has increased by about five-fold. This increase is plainly owing to the superior instruction offered, to the enlarged equipment of the seminary rooms for advanced work in the ancient classics, and to the very gratifying atmosphere of confidence and enthusiasm that has come to surround linguistic studies."

The College of Agriculture of Cornell University

The general principles on which Cornell University attempted to establish a college of agriculture were stated by President White in an address before the New York State Agricultural Society February 10, 1869. It should be built on the experience of the farm and the workshop and the common school and make master farmers thoroughly based in the sciences relating to agriculture. The principles of accounts should also be taught. The trustees at the outset were of the opinion that under the Morrill land-grant act all students in the university should be required to take some instruction in agriculture. It was therefore decided that no student should receive a diploma who had not attended lectures on general agriculture. Before the opening of the university a beginning was made of organizing an agricultural faculty. George Chapman Caldwell was elected professor of agricultural chemistry. He was a native of Massachusetts and a graduate of the Lawrence Scientific School, who had also studied at the universities of Göttingen and Heidelberg, Germany, and the agricultural college at Cirencester, England, had taught chemistry at Columbia, Antioch and Pennsylvania State colleges and had been vice president of the Pennsylvania College.

As one of the results of President White's tour in Europe in 1868 James Law was persuaded to come to the university as professor of veterinary medicine and surgery. He had taught anatomy and materia medica in the Veterinary College at Edinburgh and in the Albert Veterinary College at London, had practiced veterinary medicine in England and Ireland and was widely known as the author of a work on the Anatomy of Domestic Animals.

Joseph Harris, editor of the American Agriculturist, was appointed professor of agriculture but did not undertake the work. Governor Frederick Holbrook of Vermont was asked to be the non-resident professor of agriculture but also performed no service.

Professor Albert N. Prentiss was called from the Michigan Agricultural College to be professor of botany, horticulture and arboriculture.

Lewis Spaulding was appointed assistant professor of agriculture and farm superintendent February 18, 1869, and served in that double capacity for a year. John Stanton Gould, who had been president of the State Agricultural Society, was appointed that year non-resident professor of agriculture and for several years delivered two courses of lectures, one on general agriculture and the other on mechanics as applied to agriculture.

Rooms were assigned to the agricultural faculty in the new building, afterwards known as Morrill Hall, and the headquarters of the agricultural college were in this building for many years.

The college farm of about 200 acres was gradually developed and used in connection with the classroom work partly for observation of crops, animals, machinery and agricultural operations and partly to furnish labor for a limited number of students under the voluntary paid labor system of the university. For a long time this farm had only an equipment of ordinary farm buildings. The library was well provided with books and journals on agriculture and related sciences. A special agricultural library was given to the university by Mr. Cornell. For admission to the college of agriculture, students were only required to pass examinations in English grammar and orthography, geography, arithmetic, and algebra to quadratic equations.

The first four-year course in agriculture was scheduled as follows: For freshman, algebra, geometry, English, French, human physiology, botany and history; for sophomores, book-keeping, experimental mechanics, trigonometry and surveying, English, German, chemistry, vegetable physiology, geology and physics; for juniors, English, agricultural and economic botany, agricultural chemistry, horticulture, arboriculture, veterinary anatomy and physiology, veterinary medicine and surgery, entomology, strength and preservation of materials and practical

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in the United States, who had been members of the House of Representatives.

He was appointed to the position of

in the Department of Agriculture, and in 1946 he was appointed

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The first of these is in the Department of Agriculture, where he was appointed in 1946.

For the next three years, he was in the Department of Agriculture, where he was appointed in 1946.

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agriculture; for seniors, English, drafting, astronomy, psychology, history, political science, constitutional law, architecture, building and building materials, entomology, landscape gardening, rural economy and practical agriculture. Two and three years courses were also offered.

Under the elective system "more than two-thirds of the students in the first academic year received instruction in one or more agricultural branches, although but thirty devoted their entire attention to the subject."

After the retirement of assistant professor Spaulding there was a vacancy for a year in the department of practical agriculture. In 1871 Henry H. McCandless, who had been connected with the Royal Agricultural College at Glasnevin, Ireland, was appointed professor of agriculture and served until 1873. The separate office of farm superintendent was created. The course in agriculture was somewhat changed; the strictly agricultural subjects began with soils in the third term of junior year and manures, farm implements, field crops, animals, farm management, buildings and accounts were scheduled in senior year. Horticulture was an elective in sophomore and junior years. Professor McCandless was not well acquainted with American agriculture and was unable to adjust himself to the conditions then existing in the university. Interest in agricultural instruction declined during his term and in 1873 there were only 7 students in agriculture.

Then Professor Isaac P. Roberts was called from the Iowa Agricultural College (p. 460) as assistant professor of agriculture and was made full professor the following year. He arrived at Ithaca in January, 1874 and was much discouraged by the lack of interest at the university in its agricultural department. In his autobiography he says that "in 1874 there were only three senior students in agriculture at Cornell University and a few strays to whom I gave an hour of instruction per day, five days in the week for the rest of that year * * *. At that time the trustees had not much interest in the farm and did not know enough about

(415)

it to appreciate my difficulties." ^ Because of the trouble they had had in managing the university farm the trustees had leased it to an ordinary farmer and it was in poor condition. It contained less than 100 acres of arable land and the livestock consisted mainly of twelve "miserable" cows. The barn erected by the former professor was not at all suitable for such a farm.

Professor Roberts had been brought up on a farm in Western New York and was thoroughly acquainted with the agriculture of that region. He developed the university farm as well as he could with the means at his disposal, conducting it on a system of mixed farming with dairy husbandry as its most prominent feature. In 1880 he erected a large barn of a good type at a cost of \$7,000 and he gradually brought in improved livestock. Besides managing the farm, he engaged in instructional work, which he has described as follows:

"From 1880 onward I lectured 5 times a week throughout the year and spent two afternoons in each week with my class in the fields or shops or barns. Beside this I gave one lecture a week to the students in veterinary science and three lectures per week and some laboratory work to the winter course students." (415)

Following the plan begun in Iowa he sometimes took his students on tours of inspection of farms in different places.

The agricultural faculty was strengthened by the coming of John Henry Comstock as instructor in entomology in 1873, who was made professor of entomology in 1876, and by the employment of William Rane Lazenby, a graduate in agriculture at the university in 1874, first as instructor and in 1876 as assistant professor of horticulture, previous to his long service as head of that department in Ohio State University. Henry Hiram Wing, also a graduate of this college in 1881, served as assistant in dairying in the college before going to the University of Nebraska in 1884 as assistant professor of animal husbandry.

In 1888 he came back to Cornell University as assistant in the experiment station and in 1903 became professor of animal husbandry and entered on a long period of service there.

The four-year course in agriculture in which Professor Roberts and his associates participated, as it was scheduled in 1881-82, included for freshmen French or German, rhetoric, geometry, algebra, trigonometry, freehand drawing, hygiene, and general chemistry; for sophomores, French or German, analytical and agricultural chemistry, zoology, anatomy, botany, entomology, surveying and one elective; for juniors, mechanics and physics, analytical chemistry, agricultural botany, vegetable physiology and histology, arboriculture, landscape gardening, entomology, veterinary science and surgery; for seniors, agriculture (lectures and field work), botany, horticulture, geology, building materials and construction, American law, and one elective. There was also a 3-year course not leading to a degree. From about 1885 special students were allowed to take limited courses without passing entrance examinations.

But in New York as elsewhere for a long time conditions within and without the university were not favorable for bringing many students into the College of Agriculture. The number ranged from 17 in 1874 to 36 in 1888. In the latter year there were 3 seniors, 8 juniors, 12 sophomores and 13 freshmen. The total number of students in the university at that time was 1,211. In his annual report for 1891-92 President Adams described the College of Agriculture as "almost purely a technical school. Its design is to educate young men to be farmers in a large sense of the term, or to be teachers of some one of the branches of agriculture in an agricultural college. Professors in the College of Agriculture, with two exceptions devote most of their time to giving instruction to students not enrolled in that course. * * * Our function in the College of Agriculture seems to have been very largely to educate professors and teachers and notwithstanding the smallness of the number of students enrolled in the college it is

probable that no other department in the university can now show so large a list of alumni who have risen to distinction in their respective vocations." Among the graduates of this college during the first twenty years were D. E. Salmon, Chief of the Bureau of Animal Industry and A. M. Farrington, Assistant Chief of that bureau, Clinton D. Smith, head of the department of agriculture of the Michigan Agricultural College, and Veranus A. Moore, director of the State Veterinary College at Cornell University. It is also interesting to note that L. O. Howard, Chief of the Bureau of Entomology, graduated in a scientific course at the university in 1877.

The Department of Veterinary Science was separated from the College of Agriculture in 1896 and became the New York State Veterinary College at Cornell University. In a similar way a State College of Forestry was established there in 1898 and afterwards transferred to Syracuse University. In 1904 the State took over the College of Agriculture and provided for its equipment and maintenance but left it at Cornell University.

Experimental work on the college farm was begun soon after Professor Roberts came to the University, and in 1879 this and related work was organized as an experiment station, under a Board of Control consisting of the faculty of the College of Agriculture and representatives of the State Agricultural Society, the State Grange and six other farm organizations. Professor Roberts was president of the Board and Professor Caldwell was director.

The only special fund which the station had at first was \$250 contributed by Miss Jennie McGraw for the printing of the report. In 1881 the trustees of the university appropriated \$1,100 for the station and this was followed by \$1,145 in 1882 and \$750 in 1883.

Three reports were issued by the station before it was reorganized under the Hatch Act in 1888. The first report, issued in 1880, gives an account of field experiments by Professor Roberts with wheat, corn, oats, grass and

mangrel-wurzels. Some of these experiments were begun in 1874. There were also reported experiments by Professor Caldwell with fertilizers on corn and with cows with reference to the influence of the ration on the composition of milk; experiments in dairying, including some on the curing of cheese by Dr. S. M. Babcock; experiments in horticulture and investigations in entomology and in agricultural chemistry. Work in the same general lines was described in the succeeding reports.

Members of the agricultural faculty from almost the beginning addressed meetings of farmers to a limited extent. Professor Roberts was particularly active in this direction and kept in close touch with the State Agricultural Society and other farm organizations. The first farmers' institute in New York was the result of a special effort by Professor Roberts and J. S. Woodward of Lockport. It was held at Ithaca February 16-18, 1886 and was so successful that the next year the State Agricultural Society undertook to hold institutes annually. The agricultural faculty of the university also participated in these meetings. In his report for 1886-87 President Adams states that "a number of very interesting and profitable Farmers' Institutes have been held, and at all of them at least one of our professors has been present and taken a prominent part in the discussions and deliberations. * * * The institutes were so largely attended and the results were so satisfactory that the legislature was easily persuaded to make an appropriation of \$6,000 for institutes to be held during the coming winter."

(See also
p. 296)

Illinois Industrial University (University of Illinois)

Illinois accepted the provisions of the Morrill Land-Grant Act February 14, 1863 and received scrip for 480,000 acres. Then a bitter controversy went on regarding the disposal of this grant within the States. Some favored its distribution among several agricultural colleges and others desired to have it all given to some existing institution. Meanwhile the followers of Jonathan B. Turner, who claimed to be primarily responsible for the passing of the Morrill Land-Grant Act, were active in promoting the establishment of an industrial university which should

receive all the Federal land-grant

To understand the situation regarding this matter it is necessary to review briefly the previous history of the state funds for higher education and the early attempts to establish state colleges in Illinois. Under Federal legislation in 1804 the district of Kaskaskia in Indiana Territory received one township for a seminary of learning and when Illinois became a State in 1818 this and an additional township were granted for the same purpose. These townships with the exception of $4\frac{1}{2}$ sections were sold for \$59,838.72. The Enabling Act for the State of Illinois also granted 3 per cent of the proceeds of the sale of public lands in the State, for education, of which $\frac{1}{6}$ was to be used exclusively for a college or university. Under a State Act of February 7, 1835, the interest on both the seminary and college funds was annually loaned to the common schools. When this college fund was finally adjusted in 1863 after all the public lands in Illinois had been sold it amounted to \$156,613.32.

In 1833 an unsuccessful attempt was made to incorporate Illinois University. This was also the case with a bill introduced in 1851 to organize the "Regents of the University of the State of Illinois", who were to distribute the college and seminary funds among the colleges in the State under certain conditions, including a small conditional allotment for the teaching of agricultural chemistry, botany, geology and mineralogy. At the same session the legislature incorporated a Farmers' College in Macoupin County to promote "the general interest of education" but also to have departments of agriculture and mechanic arts when they were needed. This college was not established.

In 1852 an act was passed creating the "Illinois State University" to be located in or near Springfield. Besides the ordinary collegiate and professional departments it was to have departments of mechanical philosophy and of agriculture. This institution had been established in 1849 at Hillsboro, Montgomery County, under the Evangelical Lutheran synod. In its new location it prospered for a time but got into financial difficulties and in 1867 ceased to operate as anything more than a seminary.

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In 1853 George L. Lumsden, a member of the legislature and friend of Turner and Murray, introduced a bill to incorporate the "Industrial University of the State of Illinois." This move was only to attract attention and the bill was tables as was intended.

Another abortive effort was an act passed in February 1853 to incorporate "the Northern Illinois Agricultural College."

The Industrial League under Turner's leadership was very actively promoting the establishment of an Industrial University, but was opposed by the existing colleges in the State and by the educational forces represented in the State Teachers' Association who wanted a State Normal School. Efforts in 1855 to secure the incorporation of Illinois University were unsuccessful but an act establishing the Illinois State Normal University was passed February 18, 1857. (See p.305)

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By an act of February 21, 1861, the "Illinois Agricultural College" was incorporated and given the four and one-half sections of seminary lands still unsold. This college was "for the purpose of instruction and science in practical and scientific agriculture and in the mechanic arts." By selling their lands the trustees of this institution were able to purchase a farm of 560 acres at Irvington, Washington County, and to erect a college building and boarding hall. It was opened in 1866 but did not have funds to enable it to be properly equipped for industrial education. The legislature in 1867 therefore permitted it to have a preparatory department and teach such subjects as conditions warranted. This was not satisfactory and the State brought suit in 1871 to annul the charter and recover the property given to the institution. This was not settled in the State's favor until 1878, after which the property of the college was sold at auction.

After the passage of the land-grant act of 1862 and before the Illinois legislature had accepted its provisions several colleges made application for at least a share in the benefits of this land-grant. The legislature, therefore, immediately appointed a joint committee of both houses to inquire into the best method of disposing of this grant. On January 30, 1863 a bill was introduced "to provide a college for the benefit of agriculture and the mechanic arts." This was referred to a committee and resulted in a bill to establish agricultural colleges in Northern and Southern Illinois and permit their trustees "to make arrangements with any existing college for the accommodation and instruction of students of such agricultural college." Without taking action on this bill the legislature took a recess from February 14 to June 2 and was prorogued by the Governor June 10. Somewhat tardily the friends of an Industrial University called a convention which met at Springfield June 9. The college men promptly offered a resolution favoring the bill before the legislature but after a long discussion were defeated and a resolution

prepared by Turner was adopted which requested the legislature to defer action until the next session and provided for a committee of one from each Congressional district of the State to collect information bearing on this matter for presentation to the committee on agriculture at the session of the legislature in 1865.

During the next year and a half those who favored an industrial university were very active through lectures, press articles and resolutions at agricultural, horticultural, educational and industrial meetings. The State Teachers' Association and the State agricultural and horticultural societies favored one institution. But in July 1864 Governor Yates was persuaded to appoint a commission to report plans for dividing the land-grant fund between an agricultural college centrally located and a mechanical college in Chicago. So much opposition from the farmers was aroused by this action that the Governor disbanded the commission before it had taken action. However, when committees representing the agricultural organizations met at Springfield December 6, "a large and influential delegation from the mechanics of Chicago" came to this meeting and presented arguments for a mechanical school. Then Turner and a few of his friends drafted a bill which provided for the use of the land-grant fund by a single university whose location was to be determined by a commission. This bill was introduced in the House January 10, 1865, and during consideration there was amended so as to locate the university at Urbana, Champaign County, and to give the trustees authority to establish a mechanic arts department in Chicago and an agricultural department in Southern Illinois. The amended bill passed the House but was defeated in the Senate.

For the origin of the movement to locate the university at Urbana it is necessary to go back to January, 1859 when a company which was attempting to establish seminaries in different parts of Illinois sent a representative to that town. The company proposed to purchase 200 acres of land between Urbana and West Urbana

(in 1860 named Champaign) and to erect a substantial building. The land not needed for the school would be divided into lots and sold. Committees from the two towns assisted in securing the land and in getting subscriptions to the company's stock. Eight acres were set apart for the seminary and the construction of a building was begun. In January 1861 a memorial signed by sixty-two citizens of the two towns was presented to the legislature asking that an agricultural seminary and bureau be established in Champaign County, and given a portion of the tax fund from the Illinois Central Railroad. The legislature on February 21, 1861 granted a charter for the "Urbana-Champaign Institute", as "a seminary of learning comprehending an agricultural or other departments as the public may demand." No state aid was given to this institution. The Civil War brought financial difficulties and work on the seminary building was suspended. After the passage of the land-grant act the project to use this building for the agricultural and mechanical college was revived. The board of supervisors of Champaign County passed resolutions May 4, 1864, asking the legislature to locate such a college in that county and entered into negotiations to purchase the seminary property if the legislature granted their request. They also sought the aid of the Illinois Central Railroad, provided a fund to be used in securing the location of the college and asked authority to borrow money and issue bonds to complete this transaction. Their agent visited Springfield December 6, 1864, conferred with the farmers' committee advocating the Industrial University and brought about the amendment to their bill which located the university at Urbana. A joint committee of the legislature visited Urbana January 21, 1865, and reported favorably on the offer of Champaign County, which included the completed seminary building and grounds and 100 acres of land.

In September, 1865 the executive board of the State Agricultural Society decided to call a convention of agriculturists, mechanics and manufacturers at Bloomington to consider measures for the location of the land-grant college. This convention met December 14, 1865 and through a committee of which Turner was

chairman adopted resolutions favoring "one university of the highest order" to receive all of the Congressional grant and "the general principles adopted and approved by all parties at the last session of the legislature." A later resolution provided for a committee to revise the bill presented at the last session of the legislature and get pledges from candidates for the next legislature to support this bill.

Presidents of existing colleges in the State had a meeting in Chicago in October, 1865, and passed resolutions favoring division of the land-grant fund among institutions in different parts of the State.

In September, 1865, the supervisors of Champaign County decided to submit to the people a proposition to bond the county for \$100,000 to purchase the seminary building and a farm for the Industrial University and to bear other expenses necessary to secure the location of the university in this county. The people approved this proposition by a vote of 4601 to 1085. Mr. C. R. Griggs was elected representative to the legislature from that district with the understanding that he would push the university measure. A lobby from Champaign County was established at Springfield where the legislature met and an active propaganda involving the use of considerable money was carried on. When it became clear that the interest at the legislature would center chiefly in the location of a single university other counties took action to secure consideration. Definite offers were finally made on a financial basis from Morgan, McLean and Logan counties. Turner was especially interested in the offer from Morgan County, which involved the use of Illinois College at Jacksonville, where he had formerly taught. The McLean County proposition was for a site adjoining the Normal University.

A joint committee of the legislature which visited the four counties in February, 1867 reported the value of the offers as follows: Champaign \$285,000, McLean \$470,000, Logan \$385,000, and Morgan \$315,000 or including the Illinois College property \$419,000. But the thorough organization and persistent efforts

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of the Champaign County forces prevailed and the legislature located the university at Urbana.

Two acts regarding the university were passed in 1867. The first was an act of January 25, 1867, which provided "that any county, city, township or incorporated town of said state, may, by taxation, as well as by voluntary subscription of its citizens, raise a fund to secure the location of said university at any point whatever; and any other corporation in this state may make bids and subscription for the purpose of securing said location at any point whatever." (175) The second was the act of February 28, 1867 for the organization and maintenance of the Illinois Industrial University.

Under this act the general management of the university was vested in a board of trustees consisting of the Governor, Superintendent of public instruction, president of the State Agricultural Society, and the Regent of the University as members ex-officio, five members from each of the three grand judicial districts of the State and one member from each of the 13 Congressional districts, to be appointed by the Governor with the consent of the Senate, for a term of six years, except that the first members were to be divided into three classes to serve, two, four and six years respectively. The board may establish branches of the university at different places in the State but cannot grant to such branches any portion of the Federal land-grant fund or funds by the county, city or town near the university. The regent shall be elected for two years, shall be president of the board and the faculty and have general supervision of the educational facilities and interests of the university. A corresponding secretary shall secure "instructive information from persons in various counties skilled in agricultural, mechanical and industrial arts" and prepare an annual report on the progress of the university, with accounts of experiments and state industrial and economical statistics, to be published in editions of 5,000 copies. The trustees may establish "model farms" and such departments and professorships "as may be required to teach in the most

thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and classical studies." They may accept voluntary contributions for the endowment of professorships or departments. The minimum age of students was fixed at fifteen years and before entrance they must pass examinations in "the branches ordinarily taught in the common schools of the state." Free tuition shall be given to one descendant of a soldier or seaman from each county who has been in the United States military service during the Civil War and to such other persons as the trustees shall decide on without embarrassing the finances of the university. No degrees may be given but "certificates of scholarship" may be awarded. The trustees must permanently locate the university at Urbana, in Champaign County, whenever that county shall convey to the university the buildings and lands of the Urbana and Champaign Institute and other nearby lands, including in all 970 acres, \$100,000 in Champaign County bonds bearing interest at 10 per cent., \$2,000 in fruit, shade and ornamental trees and shrubs donated by M. L. Dunlap and \$50,000 in freight donated by the Illinois Central Railroad. The Governor was directed to transfer the federal land scrip to the treasurer of the university, who was given authority to sell it under direction of the board of trustees.

The trustees met for the first time March 12, 1867 and took the oath of office, which under the Constitution of 1848 required them to pledge among other things, that they would not engage in dueling. They then elected as Regent, Rev. John Milton Gregory (1822-1898), who through successive elections served 13 years. He was a native of Sand Lake, New York, graduated at Union College, studied law and theology, held a pastorate in a Baptist church, and had been principal of a classical school in Detroit, editor of the Michigan Journal of Education, State Superintendent of Education in Michigan, and President of Kalamazoo College. He was in full sympathy with those who would establish a broad university and as chairman of a committee appointed by the board prepared the

following outline for the departments and courses to be developed:-

- I. The Agricultural Department, embracing -
 1. The course in Agriculture proper.
 2. The course in Horticulture and Landscape Gardening.
- II. The Polytechnic Department, embracing -
 1. The course in Mechanical Science and Art.
 2. The course in Civil Engineering.
 3. The course in Mining and Metallurgy.
 4. The course in Architecture and Fine Arts.
- III. The Military Department, embracing -
 1. The course in Military Engineering.
 2. The course in Tactics.
- IV. The Department of Chemistry and Natural Science.
- V. The Department of Trade and Commerce.
- VI. The Department of General Science and Literature, embracing -
 1. The course in Mathematics.
 2. The course in Natural History, Chemistry, etc.
 3. The course in English Language and Literature.
 4. The course in Modern Language and Literature.
 5. The course in Ancient Language and Literature.
 6. The course in History and Social Science.
 7. The course in Philosophy, Intellectual and Moral. (181)

The report of this committee aroused a prolonged discussion through the State and much opposition to the university in its early years, especially among the friends of agricultural education. This was intensified by the disappointment of Turner and his associates at the outcome of the struggle over the location of the university, by the difficulties attending the organization of the agricultural work of the university, and by an apparent emphasis laid on ancient and modern language requirements for college classes. In March, 1869 the legislature passed resolutions alleging that the university was being diverted to an ordinary academic and classical school and declaring that "its leading and essential objects should be the teaching of such branches of learning as relate to agriculture, horticulture and the mechanic arts and the consequent promotion of the industrial classes in the various pursuits of life by imparting to them a liberal and practical education."

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In 1870 at a convention of delegates from the several county agricultural societies to consider conditions at the university, Professor Baker explained the act creating the university and its work under that act, and the committee, including Turner, appointed to visit the university on the invitation of Dr. Gregory, made a report which greatly helped it. They found that the university was doing more for the promotion of agriculture and mechanic arts than they had believed was being done and that out of a student body of 194 men and 14 women, 50 were in agricultural and horticultural courses, and 54 in mechanic arts and civil engineering, while only 20 were taking Latin and none were studying Greek.

The land scrip given the university was rapidly put on the market until 455,000 acres had been sold at an average of about 70 cents per acre, giving a fund of \$319,178. Invested at from 8 to 10 per cent this brought the university an income of from \$25,000 to \$30,000 per year until about 1877 when as a result of the panic of 1873, the interest rate was considerably lowered. This, combined with the refusal of the legislature to make appropriations for current expenses, brought about the necessity of reducing salaries and otherwise greatly embarrassed the university during the closing years of Dr. Gregory's administration. In 1881 the legislature was persuaded to appropriate \$11,400 to help cover the loss due to reduced interest on the endowment and during the next four bienniums, \$14,000, \$24,000, \$32,000 and \$40,000 were granted for current expenses.

The university was at first housed in the brick building donated by Champaign County. This was 125 feet front, 40 feet in depth and 5 stories high, with a wing. In 1869 the legislature appropriated \$60,000 for the biennium, including \$25,000 for farm houses, barns and other farm buildings, fencing, draining, farm equipment, livestock, fruit and forest trees; \$20,000 for buildings, equipment, trees, plants, etc. for the horticultural department, \$5,000 for the chemical department and \$10,000 for books and apparatus. In 1871 a drill hall and mechanical shop was built and that year the legislature gave \$75,000 toward the erection of a large

main building which was completed in 1873. A chemical laboratory was built in 1878 and a small astronomical observatory in 1882.

At its first meeting the board of trustees also empowered members to receive contributions for a polytechnic branch at Chicago. A proposition from the Common Council of that city to donate \$250,000 for the endowment of this branch, if the legislature would give authority to issue bonds for this purpose, was later accepted but nothing came of this offer.

The university was opened March 2, 1868 and 77 students attended the first term, of whom 45 were from Champaign County. The first faculty were William M. Baker, professor of English language and literature, and instructor in natural philosophy; George W. Atherton, professor of history and social science and instructor in Latin; A. P. S. Stuart from Lawrence Scientific School, professor of theoretical and applied chemistry; Thomas J. Burrill assistant in natural science. The subjects actually taught the first term were algebra, geometry, natural philosophy, history, rhetoric and Latin. Mr. Burrill was a native of Pittsfield, Massachusetts, and a graduate of the Illinois Normal School. He was superintendent of the public schools at Urbana when he was drafted to aid in opening the university. He was soon elected assistant professor of natural science and later became professor of botany and horticulture. Willard F. Bliss who had studied at Yale College and was engaged in farming in Illinois joined the faculty later in 1868 as professor of agriculture and instructor in French. Samuel W. Shattuck also came that year as assistant professor of mathematics and instructor in military tactics; Edward Schneider was instructor in book-keeping and German; Jonathan Periam was head farmer and superintendent of practical agriculture.

In compliance with the law establishing the university students were admitted on examinations in arithmetic, geography, English grammar and United States history. To these subjects a natural science was added when such studies became by law part of the curriculum of the Illinois common schools. Under Dr. Gregory's guidance

the trustees took the position that while they could not prevent students entering the university from the common schools it was necessary to prescribe other subjects for entrance to courses of college grade. The entrance requirements for such courses were therefore gradually raised to the high school level and about 1880 students began to be admitted from accredited high schools without examination. Preparatory classes were organized at the university from the beginning and for a considerable time at least half the students were in such classes. In 1875 a regular one-year preparatory course was established. A free elective system was adopted at first but it was soon found necessary to modify this and to require students desiring to graduate to complete a regular course of study. The trustees did not have authority to grant degrees until 1878 but before that gave "certificates of scholarship" to students who had completed certain courses. Manual labor from one to three hours a day was at first required of all able-bodied students, for which a maximum compensation of 8 cents per hour was given or for additional voluntary work $12\frac{1}{2}$ cents. There were the usual difficulties in enforcing such a regulation and before long all such labor was made voluntary unless it was directly connected with instruction. Women were first formally admitted in 1870 and the university has been coeducational since that time. In 1869 Stillman W. Robinson was elected professor of mechanical engineering and "in January 1870 a mechanical shop was fitted up with tools and machinery." The number of students increased quite rapidly and in 1870 the university was divided into colleges of agriculture, mechanic arts and engineering, chemistry, natural history, and literature, science and art. In 1873 the number of colleges was reduced to four and the organization was as follows:-

"The College of Agriculture embraced the Schools of Agriculture and Horticulture.

The College of Engineering included the four schools of Mechanical, Civil and Mining Engineering, and Architecture.

The College of Natural Science included the School of Chemistry and the School of Natural History.

The College of Literature and Arts and Science embraced the School of Modern Language and Literature and the School of Ancient Language and Literature." (181)

Besides these, there were the Schools of Commercial Science, Military Science, and Domestic Economy.

The number of men students increased to 326 in 1873 but did not reach that number again during the next 15 years. The number of women was 24 in 1871 and 90 in 1874 but declined to 70 in 1886. The number of preparatory students up to 1888 ranged between 131 and 71. During the first 20 years 3,023 students attended the university, of whom 799 were in preparatory classes; 2,224 were college students, including 1,818 men and 406 women. The graduates were 403 men and 107 women. About 50 of the graduates became farmers. The institution tended rapidly to lose its distinctive character as an industrial university. With the growth of the high school system in the State and the giving up of tuition charges by the university, the number of students taking work in the College of Literature and Science rapidly increased and that college became the largest major unit in the university. In 1875-76 when the total student body numbered 386, there were 199 in that college. The agricultural and mechanical courses had each about 50 students. The following year when the student body was about as large there were 114 in preparatory classes. This condition continued and largely through the influence of the alumni the name of the institution was changed to University of Illinois in 1885. The trustees appointed by the governor had been reduced from 28 to 9 in 1873 and in 1886 a law was enacted providing for their election by vote of the people. Under this law the Governor and State Superintendent of Education were made members ex-officio and women became eligible for election to the board.

In June, 1880 Dr. Gregory resigned and Dr. Selim Hobart Peabody was elected regent pro tempore. The following year he became Regent and served in that capacity ten years. Under his administration the university gradually grew stronger and somewhat broadened its work. In 1879-80 there were 434 students and 26 teachers of whom 15 were of professorial rank in 1890-91, there were 519 students and 40

teachers, including 24 professors. Dr. Peabody was born at Rockingham, Vermont, and graduated at the University of Vermont in 1852. For the next 25 years he was engaged in secondary school work most of the time but was professor of physics and civil engineering in the Massachusetts Agricultural College from 1871 to 1874. In 1878 he became professor of mechanical engineering and physics in the Illinois Industrial University and except for a few months in 1880 continued in that position after becoming Regent. He naturally took much interest in the College of Engineering, which was considerably developed during his administration. He also systematized the financial business of the university and secured substantial increases in its income.

Agricultural Work of the University

Originally the university had somewhat over 1,000 acres of land but soon sold about 400 acres. In 1871 the land being used by the university was divided as follows: Campus 13 acres, horticultural plantations 130 acres, experiment farm 70 acres and stock farm 410 acres. John Periam, as head farmer and superintendent of practical agriculture, was expected to develop the farms and supervise student labor on them. He held this position less than two years and then Willard F. Bliss, the professor of agriculture, became also farm superintendent. One of the major units of the university was the Department of Agriculture. It was expected that ultimately there would be two distinct courses in this department, (1) general agriculture and (2) horticulture, fruit growing and landscape gardening. A somewhat detailed schedule of the subjects to be covered by these courses was given in the first catalogue. The general subjects were choice of farm and its arrangement, farm structures, farm implements, roads and bridges, soils, subsoil, fertilizers, useful crops and products, weeds, propagation and improvement of plants, domestic animals, noxious animals, stock raising, veterinary surgery and medicine, rural laws, history, literature and economy of agriculture. A course of 3 years was laid out, as follows: First year, the farm, plant culture, English, surveying, drawing,

botany and French; Second year, soils, fertilizers, climate, roads, fruit culture, animal husbandry, mechanics, chemistry, zoology, entomology, mineralogy and German; Third year, agricultural economy, agricultural book-keeping, rural law, vaterinary science, landscape gardening, rural architecture and engineering, foreign agriculture, history and literature of agriculture, geology, meteorology, physical geography, inductive logic, political economy, history and civil politics and English literature. "The studies will be pursued partly by lectures, accompanied by courses of reading and examinations, and partly by the regular study of textbooks. Practical exercises and experiments on the farm and in the gardens, nurseries and fruit plantations will constitute a part of the course." ^{(178)?} In addition to the regular instruction a course of twelve lectures on vegetable physiology and fruit growing by John A. Warder, a prominent pomologist in Ohio, was announced. The method of instruction has been described by Henry M. Dunlap, who entered the university in 1868, as follows: "Our instruction in the classroom consisted in having a chapter in 'How Crops Grow' read and commented on by the professor of agriculture. Weari-
(179)
some hours were spent in this unprofitable work in reading books." ^ Professor Bliss resigned in June, 1870 and it was then announced that Dr. Manly Miles would be his successor. He was to divide his time between the Michigan and Illinois Colleges, serving in the latter during the fall and winter months. This arrangement was not consummated and for several years makeshifts of various kinds were made in the effort to continue agricultural instruction. "The regent and various members of the faculty gave assistance, such as it was, in class instruction." Professor Burrill continued to give instruction in horticulture. Dr. H. J. J. Detmers was lecturer in veterinary science and was succeeded in 1873 by Dr. F. W. Prentice. That year Charles W. Silver, a graduate of the university in 1872, who had studied agricultural science at the University of Halle, Germany, was appointed instructor in agricultural chemistry with the expectation that he would become professor of agriculture, but he resigned at the end of the year. Then in 1875 Dr. Miles became professor of

agriculture and instructor in agricultural chemistry, at the double salary of \$5,000. This arrangement lasted only one year.

Meanwhile the college of agriculture had been organized with schools of agriculture and horticulture. The courses in these subjects had been lengthened to four years. In agriculture the technical and scientific subjects were arranged as follows:- For freshmen, botany, chemistry, vegetable physiology, trigonometry and surveying; for sophomores, agricultural chemistry (soils, plants, fertilizers and foods), entomology and zoology; for juniors, agricultural engineering and architecture, animal anatomy and physiology, animal husbandry, veterinary science and landscape gardening; for seniors, rural economy, history of agriculture and rural law. A one-year farmers' course was also offered. In horticulture the course was the same as in agriculture, except that instead of instruction relating to field crops and animals, in junior year there was pomology, forestry and landscape gardening and in senior year floriculture, and horticultural history and rural laws.

In 1876 George Espy Morrow (1840-1900) was elected professor of agriculture and became dean of the college of agriculture in 1878, serving in that capacity for 16 years. He was born in Warren County, Ohio, was educated at Maineville Academy and in law at the University of Michigan and was a soldier in the Civil War. After several years' experience as editor of agricultural papers he became professor of practical agriculture at the Iowa State College. He was a very industrious worker and a man of very fine spirit. His long-time associate, Professor Burrill, has spoken of him as follows:

"He was singularly gifted in many ways, and these included qualifications needful in the arduous and difficult work which he undertook to perform. He harmonized opinions, co-ordinated interests, gained the confidence and good will of those in authority and of others with whom he worked. Himself an editor in his earlier career, he secured a favorable attitude on the part of the agricultural press. He was unequalled at the time as a lecturer at home and abroad upon agricultural themes, and his devotion to his subject was limitless in time and boundless in endeavor." (179)

Under Professor Morrow the general plan of the college course in agriculture was not altered materially, except that instruction in the elements of agriculture was brought down to freshman year. Unfortunately his term of service at the Illinois College covers the period when economic, agricultural and educational conditions were not conducive to bringing any considerable number of students into the regular collegiate courses in agriculture.

The published statistics of the attendance of students in the agricultural department of the Illinois University during the first 20 years are somewhat difficult to interpret but it appears that in 1871 there were 60 agricultural students and in 1876 there were 45. After the more formal organization of the College of Agriculture, it reported in 1879 only 17 students and in 1888 it had 23. Apparently these numbers included students in both agriculture and horticulture for the number recorded in agriculture alone in 1882 was 4 as compared with 24 in horticulture, and in 1884 there were 10 in agriculture and 15 in horticulture. After the bachelor's degree began to be conferred by the university, one student in the College of Agriculture received that degree in each of the years 1878, 1885 and 1888 and 3 in 1884. Among these were M. A. Scovell, Thomas F. Hunt, and Harry S. Grindley who became members of the faculty of the university. Professor Scovell was afterwards for a long time Director of the Kentucky Agricultural Experiment Station and Professor Hunt served as a professor of agronomy in the New York College of Agriculture at Cornell University, professor and dean in the Pennsylvania State College and Ohio State University and dean of the College of Agriculture of the University of California.

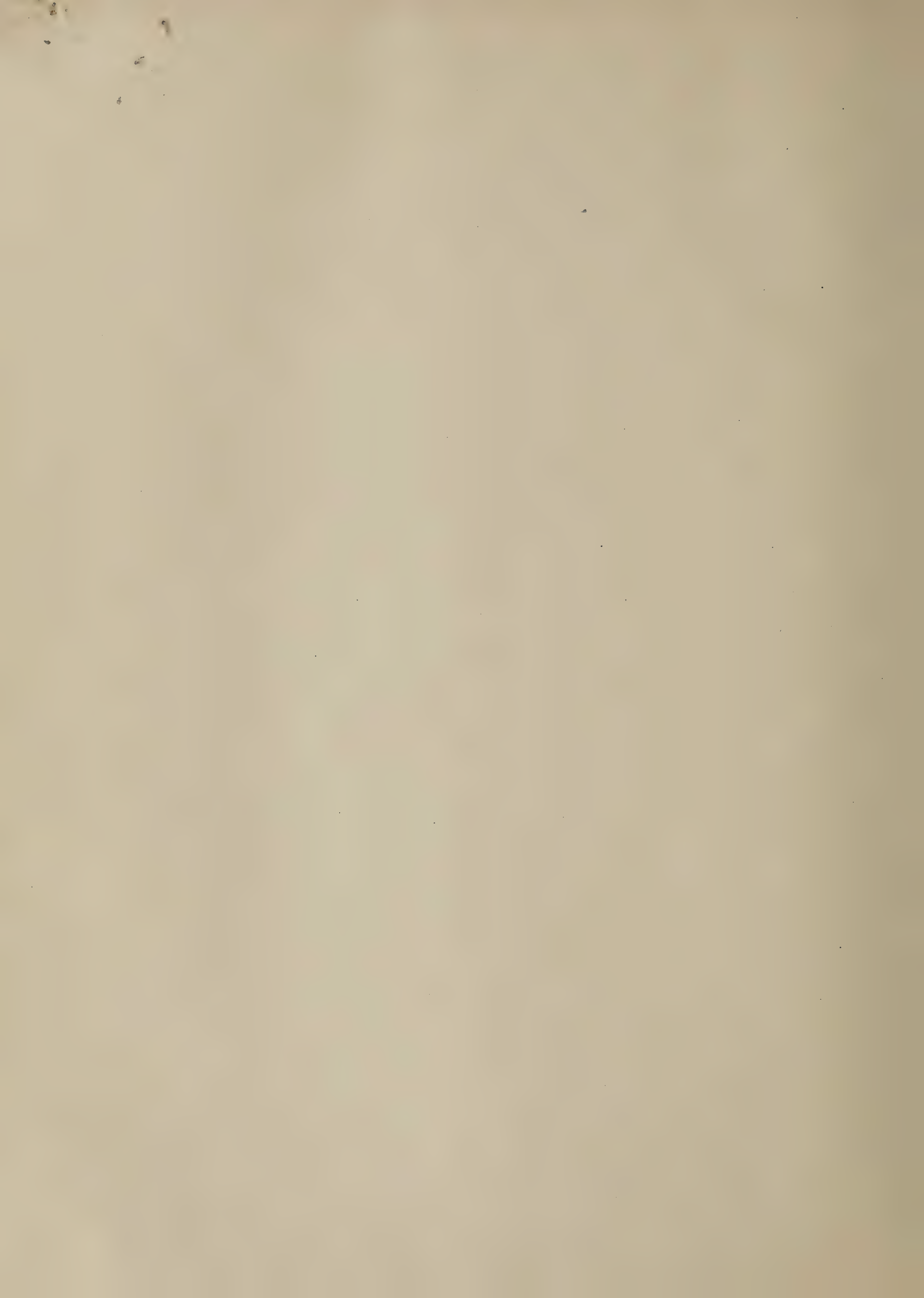
In Illinois, as elsewhere, the foundations for a much broader work of agricultural instruction in college classes were being laid by efforts in other directions.

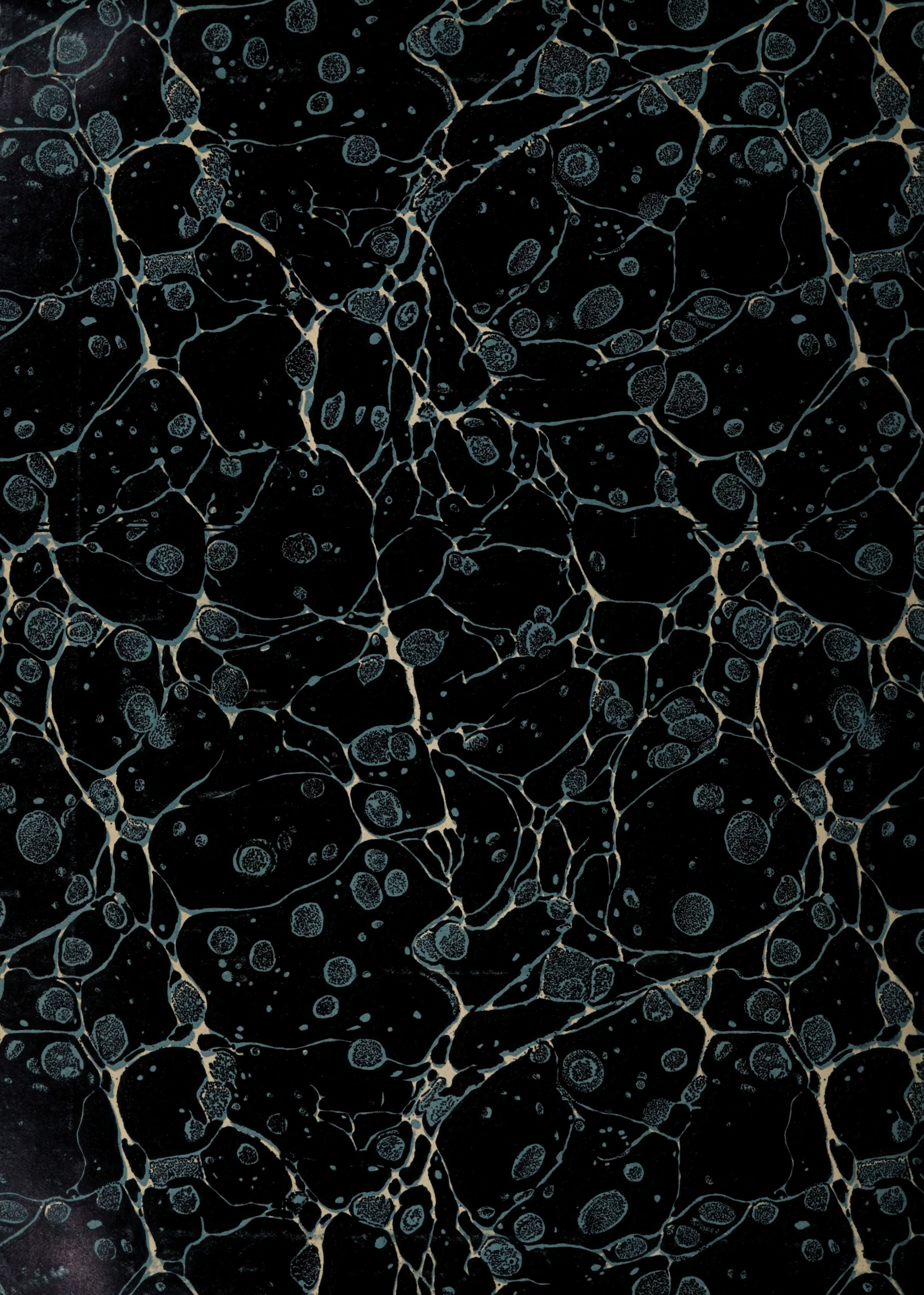
From its beginning the university undertook to establish agricultural and horticultural experiments on its lands at Urbana and set apart tracts for these purposes. In 1871 the trustees made an annual appropriation of \$2,500 for the agricultural experiments. A plan was made for field experiments with cover and other crops, on the treatment of soils and on the feeding of animals. A beginning of such experiments was reported in 1872 and further reports were made in succeeding annual reports of the university.

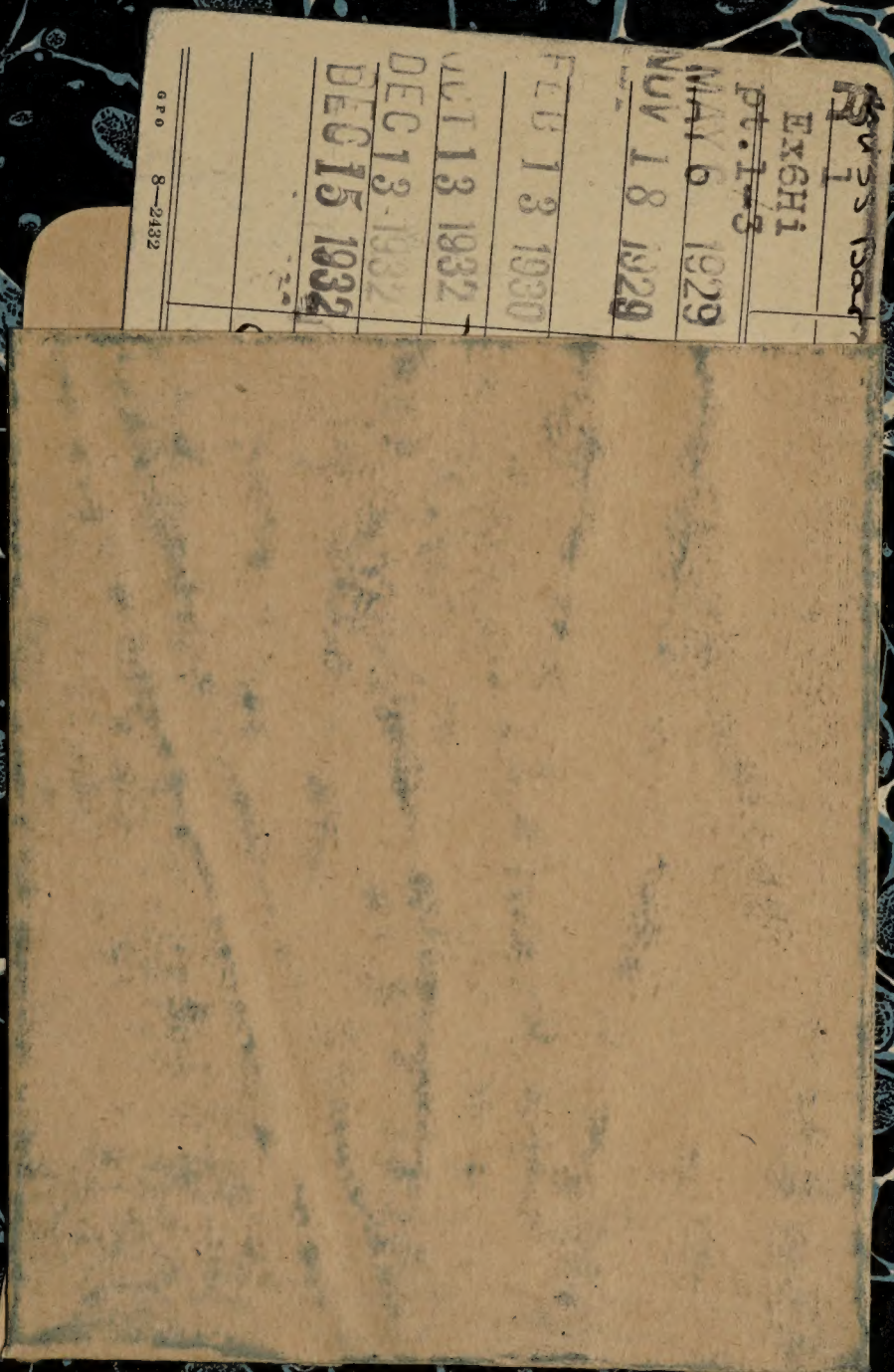
In 1875 experiments with silage were reported; sugar beets were also being tested. After Professor Morrow came, the experimental work was further systematized. Special attention was given to corn but there were also experiments with other grains, sorghum for sugar making, crop rotation, steer feeding, etc. Experiments in horticulture, begun almost as soon as the university opened, were conducted by Professor Burrill. These included variety plantations of apples, pears and other orchard fruits, small fruits and ornamental plants. There was also a plantation of forest trees. He made valuable botanical studies and collections of the flora of the State and undertook investigations of plant diseases. In 1876 he reported the discovery of bacteria in great numbers in the blighting bark of pear and apple trees. Two years later he announced that through inoculations he had discovered that bacteria caused the disease and this was confirmed by him through more thorough investigations conducted later, the results of which were published in 1880.

Professor Weber made chemical studies of soils, sugar beets, sorghums, etc. and Professor Scovell also made studies in agricultural chemistry. Accounts of the experimental work at the university were published in its annual reports, particularly from 1880. Through such work a considerable foundation was laid for the Illinois Experiment Station, which was organized at the university in 1888.

The agricultural extension work of the university began almost as soon as it was organized. Its first annual report contains an article of over 100 pages on Illinois agriculture, compiled from the replies of 34 farmers in different parts of the State. "Following the precedent of the Yale agricultural lectures" of 1860, the "First Annual Course of Lectures and Discussions" was held at the university January 12-22, 1869, and was attended by the students and many farmers. An account of this meeting, covering 240 pages, was published in the second report of the university. The following year four-days courses for farmers, which were essentially farmers' institutes, were held at the university and at Centralia and Rockford. In 1871 the legislature appropriated \$500 for such courses and they were held that winter in four places. Then they were called farmers' institutes and 5 were held in 1872 and 7 in 1873. The regent and members of the faculty often addressed other farmers' meetings and Professor Morrow was particularly active in this work. An institute held at the university in 1879 was well attended and an exhibit of animals from the university at the Fat Stock Show in Chicago in 1881 attracted much favorable attention. The management of the farmers' institutes was transferred to the State Board of Agriculture but university officers participated in these meetings. In 1888 Professor Morrow attended 28 institutes and sent papers to three others.







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